

# *Working Outlines*

## **ON HOME ELECTRIFICATION**

*for use by educational workers*

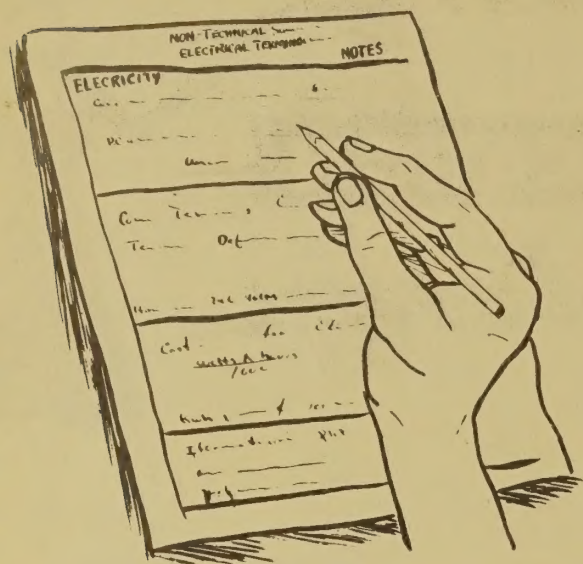


THE ATTACHED WORKING OUTLINE IS FOR USE BY LEADERS GIVING INFORMATION ON HOME ELECTRIFICATION; IT IS NOT INTENDED FOR CONSUMERS. SINCE THE HOME ELECTRIFICATION SUBJECT-MATTER FIELD IS BROAD, THE MOST USEFUL INFORMATION SHOULD BE SELECTED TO MEET THE NEEDS OF THE PARTICULAR GROUP CONCERNED. EQUIPMENT, CHARTS AND FILMS ARE HELPFUL IN GIVING THIS INFORMATION. REA HAS LISTINGS OF THESE MEDIA. A WORKING SUBJECT-MATTER OUTLINE CAN BE HELPFUL IN GAINING BACKGROUND INFORMATION AND IN PASSING THIS INFORMATION ON TO OTHERS. SOME SUGGESTIONS ON THE WAYS IN WHICH YOU CAN USE THIS OUTLINE ARE ON THE BACK OF THIS PAGE.

**U.S. DEPT. OF AGRICULTURE RURAL ELECTRIFICATION ADMINISTRATION**

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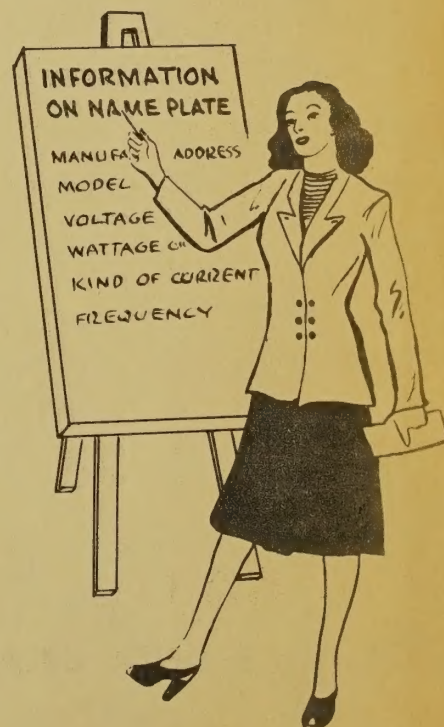
# IMPROVING YOUR OWN INFORMATION



1. **REVIEW OF INFORMATION:** The outline should serve as a rapid review of the most useful phases of home electrification subject-matter. Jot down additional points which come to mind as you read the outline.
2. **FILE FOR READING NOTES:** The space marked "NOTES" can be used for taking notes while you are reading. You may wish to indicate your source of information by abbreviation or by a number and a keyed reference list so that you can check back later to the original. Thus: p. 14, Ref. 10. The outline may be cut apart (for this purpose, REA will furnish 2 copies) and each section mounted on a 5x8 card. As you find additional usable material, you will then have space to add to it. If the outline is high on the card, room can be left for considerable note-taking, or for developing your own revision of the outline. Ideas on presenting the material to consumers can be noted on the back of the cards.

## GIVING INFORMATION TO OTHERS

1. **GUIDE FOR TALKS:** By using two copies of this outline, shears, glue and 3x5 cards, a series of card notes can be made for use in talks. These card notes can be easily revised and rearranged into any type of presentation desired. "Talking" notes for consumer presentations should not include the more technical points. Choose the most useful sections, cutting and rearranging as desired. On the back of the card, you might jot down the list of materials needed to put across your points.
2. **CHARTS:** Many sections of the outline are brief enough, or nearly brief enough, so that with a few slight revisions they could be used as charts. After your large charts are made, you can write on them the points omitted, or extra points to be made. Write light pencil notes in the margin of charts. You can read these, but your audience cannot see them. These notes help recall points and make giving talks without notes easier. Since charts are used frequently in 4-H club demonstrations, the outlines may be helpful to leaders and 4-H club members in developing demonstrations and the illustrative material for the demonstrations.
3. **TRAINING:** These outlines can be given to each of a group of leaders just as a training meeting begins. The uses of the outline should be explained at this time. Those being trained can use the space marked "NOTES" for taking down any additional points. Or the material can be sent out in advance, along with bulletins to read, and group members can be asked to take notes as they read in preparation for a discussion at a designated time.



7308  
ELECTRICAL USE IN THE HOME

LIGHTING:

FIXTURES:

CEILING  
BRACKET  
BUILT-IN EQUIPMENT

PORTABLE LAMPS:

TABLE, FLOOR & WALL  
DRESSER, BED & NIGHT  
ADAPTORS, SHADES

EDUCATION AND RECREATION:

RADIO, TELEVISION, RECORDER  
PHONOGRAPH, RECORD CHANGER  
WORKSHOP TOOLS

MOVIE & SLIDE PROJECTORS  
PHOTOGRAPHIC EQUIPMENT  
ELECTRICAL TOYS

HEALTH, GROOMING, SLEEP:

ULTRA-VIOLET OR SUNLAMP  
INFRA-RED OR HEAT LAMP  
GERMICIDAL LAMP  
VAPORIZER

VIBRATOR OR MASSAGER  
SHAVER OR RAZOR  
HAIR DRIER  
HEATING PAD, SHEET, BLANKET

FOOD PREPARATION, SERVING & STORING:

REFRIGERATION:

HOUSEHOLD  
FREEZER  
WALK-IN  
SEPARATOR, PASTEURIZER & CHURN

RANGE, HOTPLATE, ROASTER

SMALL APPLIANCES:

MIXER, COFFEE MAKER  
TOASTER, WAFFLE BAKER, ETC.  
DISHWASHER, TEAKETTLE

LAUNDRY, SEWING, CLEANING, GENERAL HOUSEWORK:

WASHING MACHINE  
CLOTHES DRIER  
IRON, IRONER  
CLOCK, CONTROLS  
SEWING MACHINE

VACUUM CLEANER  
SANDER & POLISHER  
PEST EXTERMINATOR  
INCINERATOR  
PAINT SPRAYER

RUNNING WATER:

PRESSURE WATER SYSTEM  
PLUMBING (NON-ELECTRICAL)  
AUTOMATIC WATER SOFTENER  
WATER HEATER  
WASTE DISPOSAL SYSTEM

HEATING & COOLING:

PORTABLE HEATER  
HOUSE-HEATING EQUIPMENT  
FAN, ROOM COOLER  
AIR CLEANER, AIR CONDITIONER  
HUMIDIFIER, DEHUMIDIFIER

WIRING

PROTECTIVE DEVICES (FUSES, CIRCUIT BREAKERS)

CIRCUITS:

GENERAL PURPOSE  
APPLIANCE  
SPECIAL APPLIANCE

OUTLETS:

CONVENIENCE OUTLETS  
LIGHTING OUTLETS  
SWITCHES

## SOME FACTORS TO CONSIDER IN PLANNING ELECTRICAL EQUIPMENT PURCHASES

### General Points related to Planning:

- Family -- size, habits needs, goals
- Amount of money family has to spend
- Responsibility of co-op members to use electricity for co-op success
- Advantages of electrical equipment
- Importance in relation to health
- Condition of equipment now in use
- Initial cost of equipment to buyer
  - Types available; models
  - Features and their uses
  - Materials and workmanship
- Equipment dimensions; space available
- Installation costs
- Cost of remodelling structures to obtain full use of equipment
- Operation cost (kwh consumption)
- Maintenance cost
- Money-saving and income-producing possibilities of equipment
- Possibilities of financing purchases
- Desirability of planned purchasing

### Points on Specific Pieces of Equipment:

- Reliability of manufacturer
- Dependability of local dealer
- Guarantee; servicing facilities
- Safety approval (UL); safety features
- Sturdiness in construction
- Durability in finishes
- Simplicity of design
- Ease of cleaning
- Convenient controls
- Plain and complete markings
- Complete instructions

For brief summary of points related directly to individual pieces of equipment see "Main Points to Consider when Electrifying the Rural Home" and working outlines on various types of equipment, REA.

TIME-SAVING WITH ELECTRICAL HOUSEHOLD EQUIPMENT: Figures given below in number of 8-hour days saved are some averages of studies made.

Water system	28	Range	14	Iron	10
Lighting	22	Dishwasher	14	Vacuum cleaner (6-1/2-32)	9
Washer	6-20	Ironer	11	Refrigerator	8-1/4

ENERGY-SAVING WITH ELECTRICAL HOUSEHOLD EQUIPMENT: Few energy-saving studies involving electrical household equipment have been made. Figures below show labor-saving possibilities of modernizing laundry tasks. Some of these tasks can be eliminated by automatic equipment.

#### ENERGY COST ABOVE RESTING FOR IRONING

94%	SADIRON
79%	ELECTRIC IRON, STANDING
62%	ELECTRIC IRON, SITTING
60%	IRONER - FLAT PLATE
45%	IRONER - ROTARY

#### ENERGY COST ABOVE RESTING FOR WRINGING

197%	HAND WRINGER
138%	BY HAND
125%	ELECTRIC SPINNER
99%	ELECTRIC WRINGER

#### ENERGY COST ABOVE RESTING FOR SOME LAUNDRY TASKS

191%	WASHING BY HAND
161%	RINSING BY HAND
184%	HANGING CLOTHES
139%	EMPTYING WASHER
149%	CLEANING WASHER, TUBS

#### References:

Farm Electrification Comparative Cost Data (cost figures, also figures and references on time saving) Farm Electrification Department, Sears Roebuck and Company, Chicago, Illinois. See page 35 for a list of reference bulletins.  
 Putting Electricity to Work on Your Farm (page 5, time-saving figures)  
 Westinghouse Electric Corporation, Pittsburgh 30, Pennsylvania, 1945  
 Human Energy Cost of Certain Household Tasks, Bulletin No. 282, State College of Washington, Agricultural Experiment Station, Pullman, Washington. 1933

GUIDE FOR FIGURING KILOWATT-HOUR CONSUMPTION PER MONTH

Equipment	KWH	Equipment	KWH
Clock	2	Radio	8
Coffeemaker	5	Range	100
Dishwasher	2½	Refrigerator	30
Fan (household)	2	Roaster	40
Fan (kitchen)	8	Sewing machine	½
Freezer (20 cu. ft.)	125	Toaster	3
Iron	5	Vacuum cleaner	2
Ironer	10	Wafflebaker	2
Lighting	20	Washing machine	3
Mixer	½	Water heater	240

Reference: "Your Electrified Farm," USDA, REA, Washington 25, D. C.

RELATION OF KWH CONSUMPTION TO CO-OP'S RATE STRUCTURE

USE	Aver- age kwh per month	TYPICAL RATE SCHEDULE							
		First 40 kwh \$3.00		Next 40 kwh at 4 cts.		Next 120 kwh at 2 cts.		Over 200 kwh at 1.5 cts.	
		Kwh	Cost	Kwh	Cost	Kwh	Cost	Kwh	Cost
Lights	20	20							
Iron	5	5							
Radio	8	8							
Washing machine	3	3							
Water system	15	4		11	\$0.44				
Brooding--50 chicks	50	40	\$3.00	29	1.16	21	\$0.42		
Refrigerator	30			40	1.60	30	.60		
Range	100					69	1.38	31	\$0.47
						120	\$2.40		
Water heater	240							240	3.60
Milk cooler	30							30	.45
								301	\$4.52

TOTAL MONTHLY COST FOR ALL THESE USES: . . . . . \$11.52 for 501 kwh  
 AVERAGE COST PER KILOWATT-HOUR (KWH), 2.3 cents

RANGE OF WATTAGES OR HORSEPOWER RATINGS OF HOME EQUIPMENT

	Watts		H.P.*
Clothes dryer	1650 - 4500	Clothes dryer	1/20 - 1/4
Coffeemaker	350 - 1000	Dishwasher	1/4
Heater	550 - 9000	Freezer	1/8 - 1/2**
Hotplate	550 - 1650	Ironer	1/30 - 1/6
Heavy-duty	2000 - 4400	Mixer	1/20 - 1/6
Iron	550 - 1250	Refrigerator	1/8 - 1/4
Ironer	1320 - 1650	Sewing machine	1/20
Range	6500 - 15000	portable motor	1/32 - 1/16
Toaster	450 - 1200	Vacuum cleaner	1/6 - 2/3
Wafflebaker	450 - 1000	Washer	1/6 - 1/3***

WATTAGE RANGE GUIDE FOR SATISFACTORY ELECTRICAL HOUSEHOLD EQUIPMENT:

The list below could be used to help in developing house wiring plans, selecting desirable equipment and operating equipment without overloading circuits.

2 - 10	50 - 100	150 - 400	500 - 700
Clock Shaver	Mixer (beater) Fan (portable) Heating pad Lamps Radio Sewing machine	Blanket Freezer Furnace (control and fan) Lamps Mixer Refrigerator Vacuum cleaner Washer	Coffeemaker Dishwasher Freezer Radio combination with television Room cooler

1000	1320 - 1650	1650 - 4500	6600 - 15,000, up
Coffeemaker Heater Hotplate Iron Toaster Wafflebaker	Heater Ironer Roaster	Clothes dryer Heater Hotplate Water heater	Heater Range

\* For rough estimating, it may be assumed that motors will deliver about 1 H.P. for each 1,000 watts used.

\*\* Three-fourths H.P. and larger motors occasionally found.

\*\*\* Some automatic types demand up to 1 1/2 H.P. at times.

# FIGURING THE COST OF OPERATING ELECTRICAL EQUIPMENT

**NAME PLATE INFORMATION:** The name plate on an appliance gives voltage and wattage or amperage. Useful conversion formulas, which strictly speaking, apply to heating equipment and incandescent lighting only, are:

$$\text{amperes} \times \text{volts} = \text{watts}$$

$$\frac{\text{watts}}{\text{volts}} = \text{amperes}$$

**COST FORMULAS:** In figuring operation cost of thermostatically-controlled equipment, consideration must be given to the amount of time the appliance is using electricity during its over-all operating time. Operation cost can be figured by using the formulas below:

$$\text{kilowatt} = 1,000 \text{ watts}$$

$$\text{kilowatt hour} = 1,000 \text{ watt hours}$$

$$\frac{\text{watts} \times \text{hours}}{1,000} = \text{kilowatt hours}$$

$$\frac{\text{watts} \times \text{minutes}}{1,000 \times 60 \text{ min.}} = \text{kilowatt hours}$$

$$\text{kwh} \times \text{cost per kwh} = \text{cost of operation}$$

**SAMPLE PROBLEMS:** The small 1,200-watt unit of an electric range is turned to high for 5 minutes, then turned off in a certain cooking operation. How much will this cost at 2 cents per kilowatt hour?

$$1,200 \text{ watts} \times \frac{5 \text{ minutes}}{60 \text{ minutes (or 1/12 hour)}} = 100 \text{ watt hours}$$

$$\frac{100 \text{ watt hours}}{1,000 \text{ watt hours}} = 1/10 \text{ kilowatt hours} \quad 1/10 \text{ kwh} \times 2\text{¢} = 1/5\text{¢} \text{ or 2 mills}$$

A study lamp with a 100 watt bulb is used each evening in the month for an average of 2 hours per evening. How much will this cost per month at 5¢ per kwh?

$$\frac{100 \text{ watts} \times (2 \text{ hrs.} \times 30 \text{ days}) \text{ or } 60 \text{ hrs.}}{1,000} = \frac{6,000 \text{ watt hours}}{1,000} = 6 \text{ kwh}$$

$$6 \text{ kwh} @ 5\text{¢} = 30\text{¢} \text{ (monthly operating cost)}$$

USE List appliances in the order you acquire them	Aver- age kwh per month	RATE SCHEDULE OF YOUR CO-OP							
		First..kwh		Next..kwh		Next..kwh		Over..kwh	
		..... (your rate)		..... (your rate)		..... (your rate)		..... (your rate)	
		Kwh	Cost	Kwh	Cost	Kwh	Cost	Kwh	Cost
Lights									

TOTAL ACTUAL COST FOR ALL THESE USES : : : : : \$.....

ACTUAL AVERAGE COST PER KILOWATT-HOUR (KWH).....CENTS

## ELECTRICAL HOUSEHOLD EQUIPMENT - GENERAL POINTS

### SELECTION, OPERATION, AND CARE

### NOTES

#### IN BUYING, CONSIDER:

1. Needs of the family
2. Tasks to be done, uses of equipment
3. Time, energy, & money saving angles
4. Amount of money family has to spend
5. Dimensions of equipment & space available

#### LOOK FOR THESE CONSTRUCTION FEATURES:

1. Sturdiness
2. Durability
3. Simplicity of design
4. Ease of cleaning
5. Convenient controls
6. Plain & complete markings

#### CONSIDER SAFETY & SERVICE POINTS:

1. Reliability of manufacturer
2. Dependability of local dealer
3. Guarantee and servicing facilities
4. Safety approval by Underwriters' Laboratories

#### LOOK FOR UL LABELS & LISTINGS

Labels (paper sticker, on nameplate or die labelled)

UL (simple manifest of UL inspection) -

Combination label - UL & manufacturer's name -

Markers indicating additional types of testing

Reexamination, or Special, or Inspection service

Listings

Listing in "List of Inspected Electrical Equipment," published by UL, Chicago

Listing in Card Reports in UL Offices in Chicago, New York, San Francisco and in inspection bureaus in 200 cities

#### NOTE UL LABELS ON CORDS

Marking	Quality Test	Use of Cord
Gold band	10,000 cycle	Heating appliance
Red band	3,000 cycle	Heating appliance
Yellow band	Test varies	Lamp, light motor, radio
Blue dough-nut label	Test varies with use	Extension cord & plugs assembly

#### AFTER BUYING EQUIPMENT:

1. Learn parts - location, name
2. Study manufacturer's instructions
3. Know uses
4. Locate conveniently
5. Use on proper circuit

#### IN USING EQUIPMENT:

1. Plug in, disconnect, properly
2. Try out all uses
3. Re-read instructions occasionally
4. Follow safety precautions
5. Schedule cleaning and care
6. Make repairs promptly
7. Call dealer about service problems

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#### TAKE GOOD CARE OF EQUIPMENT:

1. Place small appliances carefully to avoid dropping
  2. Don't overload. Warm cold motors before use
  3. Oil motors regularly -- unless hermetically sealed
  4. On brush-type motors (as in mixers) keep commutators clean; replace worn brushes
  5. Check regularly for loose electrical connections
  6. Keep nuts, bolts, screws tightened
  7. Disconnect for repairs, oiling, cleaning
  8. Refer major repairs to serviceman
- 

#### TREAT CORDS CAREFULLY:

1. Protect cords from: grease dirt, heat, moisture, kinks, sharp edges, friction
  2. Wrap fraying sections with friction tape
  3. Replace cords unless shortening can repair
  4. Disconnect plug from outlet first, then appliance
  5. Grasp plug to disconnect; don't jerk cord
  6. Hang over peg or two hooks, or coil
- 

#### KEEP EQUIPMENT CLEAN:

Storage: Cover when not in use, for example, a mixer  
Enamel: Remove spillage immediately; use dry cloth or paper if appliance is hot  
Let cool; use soapy water; rinse; dry  
Use whiting or mild abrasive on spots  
Try ammonia & water on baked-on spots  
Metals: Use mild soap, warm water to wash; rinse, dry  
Polish with whiting or silver polish  
Units: Wipe spillage, char; use soft brush  
Motors: Disconnect. Use vacuum cleaner or brush  
Cords: Wipe with dry cloth if fabric-covered  
Use damp cloth on rubber-covered cords

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#### WHEN EQUIPMENT WON'T OPERATE, CHECK:

Controls: See if time or temp. settings are correct  
Outlet: Try another appliance or use test lamp  
Other circuits: Electricity may be off. Check lights  
Circuit breaker: Disconnect equip., reclose breaker  
Fuse: If blown, disconnect equip., put in new fuse  
Cord: Disconnect. Look for fraying, break - replace  
Plugs: Examine connections. Tighten if loose  
Appliance: Look for loose connections. Tighten

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#### FOLLOW SAFETY SUGGESTIONS:

1. Keep appliance and cords in good repair
  2. Use appliances on proper circuit
  3. Do not run cords under rugs or over nails
  4. Disconnect equip. for cleaning, oiling, repairs
  5. Avoid touching terminals until disconnected
  6. Avoid using faulty electrical equipment
  7. Avoid contact with ungrounded equipment while also touching:
    - Wet floor            Radiators
    - Damp ground        Wiring, switches
    - Plumbing            Other ungrounded appliances
  8. Use proper size fuse or circuit breaker for protection. When fuses are used, keep an extra supply on hand. Before replacing fuse, open the main switch.
-

## MAIN POINTS TO CONSIDER WHEN ELECTRIFYING THE RURAL HOME

(Equipment is listed in the approximate order of purchase usually considered desirable; actual order varies according to family needs and amount of money family has to spend)

**WIRING:** Good wiring is the foundation of good electric service in the home. Plan to have:

*Enough circuits of right size wire:* Kitchen, dining room and laundry should have enough appliance outlets on appliance circuits, which have larger than #14 wire, to provide for full use of high-wattage equipment now and in the future. The wire sizes on appliance circuits shall be #12 or #10, occasionally for heavy-duty equipment #8, and for the range three #6 wires. General purpose circuits serve fixed lights, portable lamps, radios, cleaners, small fans and similar low-wattage equipment; they use #14 or #12 wire and 15 ampere fuses or circuit breakers.

*Enough outlets, lights and switches:* Since appliance and lamp cords are usually 6' long, provide a convenience outlet for about every 12' of space around the wall or for any shorter usable wall space; never have less than two in a room. Place workroom convenience outlets and all switches about 40" above the floor; outlets in other rooms may be 18" above the floor or in the baseboard. An outlet in a switch plate provides an extra place at a convenient height for plugging in a vacuum cleaner. Have 3-way and 4-way switches at most-used entrances, so that lights can be controlled without retracing steps. \*T-rated switches are desirable; mercury switches are quiet. On light walls ivory switches, outlets and plates are preferable.

*Adequate entrance for electric service:* The service entrance for maximum use should be not less than three #6 wires. This 3-wire service provides 120/240 volts.

**LIGHTING:** No bare bulbs should be used in the home except in closets and unused parts of attics and basements and possibly, in the case of fluorescent tubes, in places where used briefly or placed out of line of vision, such as at bath and bedroom mirrors or under kitchen cabinets. For good lighting, we need:

- |                                                   |                                            |
|---------------------------------------------------|--------------------------------------------|
| 1. <i>Enough light:</i> .....                     | Light can be measured in footcandles       |
| <i>Large enough lamp bulbs</i> .....              | Use size suggested for equipment bought    |
| <i>In enough places and well-located</i> .....    | There should be no sharp shadow on work    |
| <i>With good surrounding equipment</i> .....      | Light colors, dull finishes are best       |
| 2. <i>Light of good quality:</i> .....            | Brightness is measured in footlamberts     |
| <i>Softly diffused and well-shaded</i> .....      | Use white bowls, white shade linings       |
| <i>Pleasing in color and brightness</i> .....     | Avoid glare, shadow and spotty diffusion   |
| 3. <i>Well-balanced distribution:</i> .....       | Ceiling fixtures provide this economically |
| <i>General lighting should be at least</i> .....  | There should not be a notable contrast     |
| <i>1/10 of local lighting on close work</i> ..... | between light on work and light in room    |

Ceiling fixture diameter should be at least as wide in inches as width of room in feet, preferably corresponding more nearly with diagonal of room. Wattage of incandescent bulbs in single-bulb fixtures corresponds with fixture diameter as follows: 3 1/2" - 40w.; 4", 5", 6", 7", - 60 or 40w.; 8", 9" - 75w.; 10" - 100w.; 12" - 150w.; 14" - 200w.; multiple-bulb fixtures require higher wattages to give the same amount of light. In lamps, bulb size corresponds with diffusing bowl diameter, and, because shaded, bulb wattage can be higher than in fixtures of same diameter, IES-type bowl: 6" - 75w.; 8" - 100w.; 9-3/8" - 150w.; 10" uses 100-200-300w. CLM-type: 8" B and 7 1/2" C bowl uses 50-100-150w.; and the 10" A type, 100-200-300w.

Buy simple, inconspicuous fixtures and put more money in portable lamps, if money is limited. Fluorescent tubes give two to three times as much light as incandescent or filament bulbs for the same wattage. They are also cooler, give a whiter light lower in brightness, and last longer. Some fixtures and lamps carry certification tags indicating quality. Among these are the AHII (American Home Lighting Institute) tag for fixtures, and the CLM (Certified Lamp Makers) tag for portable lamps. Use size bulb specified in equipment. Keep equipment clean.

**RADIO:** 6-tube, table model without push-button tuning is usually best buy in low-cost radio. Larger size, table or console models reproduce sound better. Radio phonograph is used more if equipped with record changer.

**IRONING EQUIPMENT:** Recommended--automatic, 2 1/2 - 4 lbs., 1000w., permanently attached cord, large sole plate. Steam iron is for pressing woollens, silks; less useful in ironing cotton-linen wash. An ironer may come later in the buying plan. It saves time and permits sitting throughout ironing. Portable models, or floor models without cabinet covers are in lower price bracket and do satisfactory job. Thermostatic control is essential.

**ELECTRIC WATER SYSTEM:** Place high in buying plan. Running water ranks first in time and energy saving. Provide water for kitchen, laundry, bath, garden, poultry, and livestock. Install system large enough to meet the needs. For example, 3/4" garden hose will handle about 300 gal. per hr. Small pipe limits usefulness of an otherwise adequate system. A good water system requires a good well. The well should be curbed to prevent contamination. Health authorities will usually test water to find what organisms it contains.

\*Tungsten-rated

**WASHER:** Cost range is - wringer, \$50-\$150; spinner, \$150-\$200; automatic, \$200-\$350. Wringer type—usually 8 or 9 lb. size with pull-stop or easy-acting safety release on wringer; consider value of pump, at additional cost of \$10, for draining water when lacking floor drain. Spinner type—some have safety lid-locking feature making accident with spinning basket impossible. Automatic type—~~agitator type has stronger washing action than cylinder~~; requires adequate supply hot and cold running water under pressure and adequate drain facilities; some have means of holding water for use again, also of adding clothes during cycle. Evaluate time and energy saving values, safety features, relative cost of all types of washers.

**REFRIGERATION EQUIPMENT:** A household refrigerator should be large enough, minimum of 6 cu. ft. and preferably 7 cu. ft. for two persons, larger for more ( $\frac{1}{2}$  to 1 cu. ft. for each extra). Its door should open on the side near the work-space. Weigh special features against extra cost; plan for storing frozen food, quantities of milk, eggs. Know how you will solve quantity freezing and storage of food: by locker plant, home freezer, walk-in? Home freezer: at least 5 and preferably 6 cu. ft. per person for freezing and storing; freezing compartment separate from and not over 1/10 of freezing and storage space; reliable maker, reputable dealer extremely important.

**SMALL APPLIANCES:** Chromium-plated finishes and thermostatic controls are desirable on small cooking appliances; higher wattage (around 1000w.) speeds cooking. Consider a coffcemaker or toaster first; perhaps a combination wafflebaker and sandwich toaster later. Mixer is very useful; don't buy inexpensive beater or whipper; secure sturdy equipment in \$30 bracket, or up.

**VACUUM CLEANER:** Upright cleaners using brushes, agitation and suction usually remove more deeply-imbedded dirt than do straight suction cleaners, which come in either tank or upright models. Upright cleaners of either type have nozzle height adjustment devices which listed in order of convenience in use are: automatic adjuster, foot operated and hand operated adjuster. Factory-rebuilt equipment offers saving in purchase price.

**HOT PLATE:** Recommended—1000w. or higher, 3-speed switch, durable finish. Some have range units.

**ROASTER:** Rectangular shape; thermostatic control; glass or ovenware dishes can go directly to table. Note: Cost of good hotplate and roaster is 1/3 to 1/2 the cost of an apartment range.

**RANGE:** Full-size preferable, but apartment-size can do job. Evaluate special features against their cost (a \$15 to \$20 timer clock, if not used as a timer for cooking, makes a rather expensive timepiece.) Look at stripped models: they have same units, same ovens as more expensive models. Weigh conveniences of extra features against having another piece of equipment like a mixer. Consider water-heating problem; use range boiler or electric heater. Consider kitchen heating problem; use separate heater matching range and burning wood, coal, or cobs, with coils through firebox for heating water, using old range boiler.

**ELECTRIC WATER HEATER:** Homes with running water - consult power supplier for possible special low electric rates on certain types of electric storage heaters. Use heater with large tank - 60 or 80 gallon size is needed on many farms. Homes without running water might use 2-10 gallon pin-up displacement type. Electric teakettle is useful in many cases; type with automatic cut-off is preferable.

**CLOTHES DRYER:** Rotary tumbler type or cabinet models are available. Higher wattage dryer gives more rapid drying; look for time and temperature controls.

**DISHWASHER:** Usually needs hot running water and drain facilities; however, some heat water to be used. Completely automatic controls save time, bother.

**INCOME-PRODUCING FARM EQUIPMENT:** Consider garden watering, chick brooder, poultry house lighting, water-warmers, pig brooder; portable motor, feed grinder, milking machine and other productive uses early in electrification plan. They can help to pay wiring, lighting and equipment costs and monthly bill.

# NONTECHNICAL SUMMARY OF ELECTRICAL TERMINOLOGY

## NOTES

### ELECTRICITY

Current - flow of electricity; alternating, direct

AC Direction reverses at regular intervals;  
frequency is usually 60 cycles per second.

DC Current flows continuously in same direction;  
found in some home plants and in some downtown  
and industrial areas. Many home plants are 32 v

Equipment - either a-c or d-c; or both ac-dc.

AC-DC - Universal motors, incandescent lighting &  
heating equipment unless it has automatic control,  
can operate on a-c or d-c if voltage is same.

Do not use other d-c equipment on a-c circuits,  
or a-c equipment on d-c circuits.

Conductors - copper, aluminum, other metals

Insulators - glass, porcelain, rubber, plastics

Grounds - earth, driven rods, or piping systems  
when interconnected with other grounds.

### COMMON TERMS OF ELECTRICAL MEASUREMENT

Term:	Definition - unit of measurement of:
Volt	A force - difference in potential
Ampere	Rate of flow - current
Ohm	Resistance to current flow
Watt	Power - rate of doing work
Kilowatt	1000 watts
Watthour	1 watt used 1 hour (watts x time)- work
Kilowatt-hour	1000 watts used for 1 hour (1 kw x 1 hr. or 100 w x 10 hrs.)
Horsepower	746 watts (1 hp = 1 kw apparent power)
Kilovolt-ampere	1000 volt-amperes (transformer capacity)
Demand	W or kw load at installation terminals

### COST FORMULA FOR ELECTRICITY

$\frac{\text{watts} \times \text{hours}}{1000}$  gives kwh

kwh x  $\frac{\text{\$}}{\text{kwh}}$  gives cost

USEFUL FORMULAS (Strictly speaking, these apply to  
heating equipment and incandescent lighting only.)

amperes x volts = watts       $\frac{\text{watts}}{\text{volts}} = \text{amperes}$

(amperes x volts x power factor = watts - for motors,  
welder, fluorescent and germicidal lamps)

### INFORMATION ON NAMEPLATE OF EQUIPMENT

Manufacturer's name, address

Model number; serial number; type

Volts

Watts or amperes

Kind of current (a-c, d-c, or both ac-dc)

Frequency (usually 60 cycles)

### RELATED ELECTRICAL TERMS - from power source to house

Generation plant      Transmission lines

Substations      Distribution lines

Types of distribution (primary or "high") lines

Single-phase (2-wire on distribution lines)

Three-phase (4-wire or 3-wire on distribution lines)

Transformer (1½, 3, 5, 7½, 10, 15, 25 kva or larger)

## Secondary lines

Single-phase: 2-wire, 115 v; or 3-wire, 115/230 v

Three-phase: 4-wire, 115/230 v (single and 3-phase)

Yard pole or meter pole

Meter loop

Kwh meter (watt-hour meter), dial or cyclometer type

Service wires

Service drops

Service entrance switch (main disconnect)

Service entrance - types

2-wire 115 v (110 to 120 v)

3-wire 115/230 v (120/240 v)

Service equipment (load or control center)

Circuit breaker or fuse box, sometimes main &

branch panel boxes with feeders or risers

Protective devices - breakers or fuses

Ground - electrical connection to earth

Circuits

Open ("dead," "cold")

Closed ("live," "hot")

Types of interior-wiring circuits:

General purpose (15 amp branch circuit)

Appliance (20 amp branch circuit)

Individual appliance - special purpose or heavy duty

Convenience outlets (double or duplex, triple)

Power or heavy-duty outlets

Lighting outlets

Toggle or low-voltage switches

Fixtures, portable lamps & equipment or appliances

---

## ABBREVIATIONS USED IN ELECTRICAL LITERATURE

A.	Angstrom (unit for measuring wave length)
amp	ampere (also a. or A)
a-c	alternating current (also AC, A.C., a.c.)
AM	amplitude modulation - radio
AWG	American Wire Gauge (Awg)
Btu	British thermal unit (also B.T.U.)
cal	calorie
d-c	direct current (also DC, D.C., d.c.)
E-viton	Erythema viton - sun lamp rating
ft-c	foot-candle (also FC, ft.-c.)
ft-l	foot-lambert (also FL, ft.-l.)
FM	frequency modulation - radio
hp	horsepower
K.	Kelvin (degrees temperature; fluorescent)
kc	kilocycle (also kc.)
kva	kilovolt-ampere (also kv.-a., kv-a)
kw	kilowatt (also kw., KW)
kwh	kilowatt-hour (also K.W.H., kw.-hr., kw-h)
rpm	revolutions per minute (also r.p.m.)
T-rated	tungsten-rated - applies to switches
v	volt (also V, v.)
w	watt (also W, w.)
wh	watt-hour

---

# ELECTRICAL WIRING FOR THE HOME

## PLANNING, SELECTION & INSTALLATION POINTS

## NOTES

### ADEQUATE, SAFE WIRING:

Reduces hazards to family, livestock & property  
Permits equipment to operate speedily, satisfactorily  
Keeps operating cost of equipment low  
Makes arrangement and use of equipment easy  
Removes probable rewiring later at considerable expense  
Provides for equipment additions without major changes  
Eliminates need for extension cords

### GOOD WIRING ASSURES GOOD RESULTS:

Heating Equipment:	Lighting:
Rapid heating	Lights burn brightly
Lower current cost	Fewer blinking lights
Safety, continuity	Convenience of control
Motors:	Wiring System Usage:
Faster starting	Fewer blown fuses
Maximum power	Less tripping of breakers
Cooler operation	Less heating of wires
Increased life	Less damage of insulation
Fewer burn outs	Plenty of outlets, controls
Lower current cost	Fewer shorts, fires, shocks

### BEFORE PLANNING THE WIRING:

Study bulletins on wiring, lighting  
Learn home and farm uses of electricity  
Consider present and future usage  
List equipment you may have in 10 years  
Study plans for good arrangement of:  
    Kitchen                      Laundry  
    Bathroom                    Workroom  
Decide where you will place equipment  
Think about rearrangement of furniture  
Learn approximate cost of various type outlets  
Learn methods of financing wiring

### IN PLANNING THE WIRING:

Allow 2 to 5% of total cost of building  
Make a rough plan for your wiring layout  
Discuss plan with family, co-op personnel, wiremen  
Secure more than one bid on exactly same plan  
Choose a reliable wireman  
Mark exact location\* of outlets, switches &  
    lights on walls; or make floor plan & mark

### IN WIRING, INSTALLATION SHALL CONFORM WITH:

National Electrical Code  
Local power supplier's requirements  
Local and state regulations  
Your own requirements for use

### AFTER WIRING:

Have wireman label circuits in load center  
Have wiring inspected  
Pay not over 80% of wiring cost until  
    wiring is inspected and approved

\*Use chalk or 3x5 cards and thumbtacks.

---

#### ADEQUATE WIRING PROVIDES:

Enough convenience outlets, lights and switches

Enough circuits of right-size wire

General purpose or 15 amp

Appliance or 20 amp

Individual appliance

Adequate entrance for electric service

3-wire (115/230 volt) for full use

Breaker or fuse box (minimum of 60 amps)

with spare circuits for later expansion

---

#### ENOUGH OUTLETS (proper type to serve use,

& in right place - cords are 6' usually):

1 duplex outlet for every 12' of wall

1 duplex outlet for any shorter usable space

Appliance outlet at each working area

(or one for every 4' of counter space)

Appliance outlets in dining areas - no place

along wall more than 10' from an outlet

Heavy-duty outlets for 115/230 v equipment

3-pole grounding outlets for laundry equipment

Not less than 2 duplex outlets in any room

Weatherproof outlets on porches, outdoors

---

#### LOCATION OF OUTLETS:

Kitchen & most workroom outlets 40 - 42" above floor

Washer outlet may be suspended rigidly from ceiling;

iron outlet 36" above ironing board

Other outlets - 18" above floor (may be in or

just above baseboard; in switch plate except

in kitchen, dining room, laundry or workroom)

Outlet near homemaker's dining chair

Bathroom outlets - high & away from tub and lavatory

---

#### ENOUGH SWITCHES:

3- or 4-way toggle switches or low-voltage switches\*

at most-used room and hallway entries unless

entrances are closer together than 10'

Switches at top and bottom of stairways

Wall-switch for bathroom mirror lights

Wall-switch for lights at sinks, lavatories

---

#### ENOUGH LIGHTING OUTLETS:

Ceiling light in each room (except possibly bath-

room less than 60 sq. ft. with mirror lights) or

lamp on switch-controlled duplex outlet

Two ceiling fixtures in rooms twice as long as wide

Light at sink, work areas, bathroom mirror

Light on porch, in halls & most closets

Light at head and foot of stairways

---

#### LOCATION OF HOUSE SWITCHES, LIGHTS:

Switches - about 48" above floor, on lock

side of door, near door

Lights - usually centered in ceiling; may

be centered over working areas

Wall brackets - usually 5' 8" above floor &

paired (about 30" apart in bathroom)

---

\*For 2 entrances - use 2 3-way switches. For 3 entrances - use 2 3-way & 1 4-way. For 4 entrances - use 2 3-way & 2 4-way. Or use low-voltage switches at any or all entries.

---

## IN BUYING SWITCHES, OUTLETS, PLATES:

Choose ivory equipment for light walls

Buy good quality equipment

UL approved

T-rated switches

Double-wipe contacts

Weigh special features vs. cost

Mercury switches for quietness

Pilot light to show current on or off

Small luminous spot showing location

---

## WIRING PROTECTIVE DEVICES:

Circuit breakers:

Magnetic, or

Combination (magnetic & thermal)

Thermal element provides time delay on temporary overload, as in starting motors

Magnetic element opens breaker instantly on very heavy overloads or short circuits

Fuses - with or without time-lag features:

Type S (tamper-resisting)

Ordinary plug fuse (not recommended)

Cartridge fuse (one-time fuse preferable)

---

## ADVANTAGES OF CIRCUIT BREAKERS:

Easy to use - flip of breaker closes circuit

No waiting for someone to change fuses

Never out of fuses - nothing to replace

Safe - service restored by switch-like device

Wrong-size protection cannot be substituted

No fire hazards from make-shift substitutes

No shocks in damp places or from poor use

Long-lasting - lasts the lifetime of a house

Attractive enough to put in kitchen or halls

---

## PROVIDE CIRCUITS OF FOLLOWING TYPES:

Name	Location & Use of Circuit	No. Needed
General purpose (15 amp)	Lights & outlets in living, bath & bedrooms, halls; lights in workrooms; fixtures, portable lamps, radios, small appliances	1 for each 500 sq. ft. floor space of house
Appliance (20 amp)	Kitchen, laundry, workroom and dining room appliances (Not for lights - use 15 amp)	2 or 3 per house*
Individual appliance or special purpose	Kitchen, laundry, workroom & utility or furnace room, occasionally attic & bath. See list of equipment, p 4	1 for range 1 for water heater See list
Spare or extra	Breaker or fuse box with space for future expansion	1 minimum, 2 preferable

\*Two for house under 1500 sq. ft. area.

3 or more if house is over 1500 sq. ft.

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### INDIVIDUAL CIRCUITS:

Required for:	Desirable for:
Range and/or	Home freezer
Water heater	Automatic washer
Furnace equipment	Air-cooling unit
Electric furnace	Bathroom heater
Built-in heaters	Work shop or bench
Ironer	Dishwasher
Clothes dryer	Motors over 1/3 hp

---

### WIRING REQUIREMENTS:

Type of circuit	Wire Size	Fuse-* Amps	Circuit Voltage	Capacity in Watts
General	14	15	115	1725
purpose	12	15	115	1725
Appliance	12	20	115	2300
Individual	12	20	115	2300
special	10	30	115	3450
appliances	8	40	115/230	4600-9200
Range	6	55	115/230	6325-12650

---

### WHEN CHANGING A FUSE:

1. Disconnect the appliance you believe caused the fuse to blow
2. Open the main switch
3. Find out which fuse has blown
4. Remove blown fuse
5. Replace with new fuse of proper size
6. Close the main switch

Remember to stand on dry board when changing fuse. Keep face from being directly in front of fuse.

---

### UL APPROVAL MEANS SAFE ELECTRICALLY: LOOK FOR:

UL labels

Listing in "List of Inspected Electrical Equipment," published by UL, Chicago

Listing in Card Reports in UL Offices in Chicago, New York, San Francisco and in inspection bureaus in 200 cities

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### GROUND PERMANENTLY CONNECTED EQUIPMENT BY:

3-wire cord and polarized outlet

Bare or insulated wire from equipment frame to metal water pipes that are bonded to ground wire, or connect wire directly to ground rod

---

### ADVANTAGES OF GOOD WIRING DESIGN:

Saving of time, energy, temper & money

Convenient location of equipment

Efficient operation of equipment

Expansion of use as years pass

Safety - fire and shock protection

Lower insurance rate on property

Higher resale or loan value for property

---

\*Over-current protection - either fuse or breaker.

# STORAGE TYPE ELECTRICALLY OPERATED WATER HEATER FOR THE HOME

## SELECTION, OPERATION, AND CARE POINTS

## NOTES

### ADVANTAGES OF HEATING WATER ELECTRICALLY:

- Safe (fumeless - flameless)
- Clean (sootless - smokeless)
- Flexible (short water lines - no flue or vent)
- Adaptable (easily located in home)
- Economical (insulated tank; automatic control)
- Convenient (no lighting - no turning off or on)
- Saves time and labor
- Aids in better health, grooming, home management
- Dependable (thermostat temperature control)

### STRUCTURE AND PARTS OF STORAGE TYPE HEATERS:

- Outer shell Cold water baffle or deflector
- Insulation Heat trap
- Tank Drain
- Heating elements Magnesium rod to control corrosion
- Thermostats Pressure-temp. safety release valve

### TYPE OF HEATING ELEMENTS:

1. Strap-on, single or double, encircling tank
2. Immersion, single or double, hair pin or sickle shape, inserted radially in tank
3. Immersion, single, inserted vertically through top of tank

### SHAPES OF EXTERIOR SHELL:

- Round (cylindrical)
- Rectangular - full height or upright
- Rectangular - table top with or without toe space, backsplash and lamp

### NEMA STANDARDS ON WATER HEATER SIZES & ELEMENTS:

#### Single Element

Tank Size in Gallons		Element Wattage Rating
Range	Nominal	
30-35	30	1500
35-45	40	2000
45-55	52	2500
55-70	66	3000
70-90	80-90	3000

#### Two Elements

Tank Size in Gallons		Element Wattage Rating	
Range	Nominal	Upper	Lower
30-35	30	1000	600
35-45	40	1250	750
45-55	52	1500	1000
55-70	66	2000	1250
70-90	80-90	2500	1500
90-115	110	3000	2000
115-135	120	4000	2500
135-175	140	4000	3000

---

### SUGGESTIONS FOR SELECTING WATER HEATER SIZE:

(Household use only; 16-24 hr. heating time)

<u>No. Persons</u>	<u>Size in Gals.</u>
With automatic washer use at least 52 gal. size	

2	30
3	40
4	40
5	52

Larger capacity recommended for home & farm use

---

### \*TYPICAL PURCHASE PRICES:

<u>Gals.</u>	<u>Elements</u>	<u>Tank</u>	<u>Price</u>
30	single	galvanized	\$132.50
30	double	glass lined	142.50
52	double	galvanized	154.50
50	double	glass lined	157.50
80	double	glass lined	215.00

\*These prices vary with makes, localities)

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### INSTALLATION COSTS:

\*Average costs in 1947:

Utility or power supplier	\$23.00
Plumber and electrician	29.00
Total	52.00

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### OPERATING COSTS:

Average monthly use for 4 - 240 kwh

240 kwh at 3¢ - \$7.20 per month

240 kwh at 1.5¢ - 3.60 per month

240 kwh at 1¢ - 2.40 per month

Probable use ranges from 150 to 325 kwh

---

### FACTORS AFFECTING OPERATING COSTS:

Leaky faucets	Distribution of demand
Long runs of pipe	for hot water
Pipe size	Size of family
Placement of heater	Family's water use habits
Circulating system	Number of bathrooms
Tempering tank	Automatic washer, dishwasher
Supplemental heating	Quality of insulation

---

### WIRING:

Special rates may require special wiring and protective features. Consult power supplier. Provide separate circuit of required size for voltage and length of run, 2 wires not less than #12 AWG, tank grounded for safety.

A switch in circuit near heater is desirable.

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### PLACEMENT AND INSTALLATION:

Place as near as practical to kitchen sink, adjacent to or directly below bathroom, and adjacent to laundry area.

Unless heater is equipped with thermal safety fuse, install temperature-pressure relief valve immediately adjacent to heater.

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\*From Electrical Merchandising, 1947.

---

PREVENTION OF CORROSION AND SCALE DEPOSIT:

1. Buy glass lined tank (see warranty)
2. Buy tank with magnesium rod inserted
3. Buy copper or monel tank. (Non-corrosive.  
Initial cost high.)
4. Install water softener ahead of heater
5. Install feeder of corrosion-resistant  
chemicals in water supply line
6. Use lower water temperature - not over 150°
7. Avoid use of furnace coils for heating

---

IN SELECTION LOOK FOR:

1. Type tank suited to water supply
2. Adequate size for present and future needs
3. Good insulation
4. UL approval
5. Easily accessible drain
6. Easily accessible electrical and  
plumbing connections
7. Cold water baffle or deflector
8. Heat trap to prevent back circulation

---

BEFORE BUYING:

1. Consult with power supplier regarding:  
wattage requirements, tank size, lowest  
rate available, additional service  
entrance facilities and wiring if any required
2. Consider the economy of electric cooking  
and water heating over water heating only
3. Read warranty carefully

---

USE AND CARE:

1. Set thermostat at lowest temperature  
desired for most uses. (Upper thermostat  
about 5-10° F lower than lower one.)  
130° - 140° - Hot enough for most household tasks  
150° - Factory setting in most cases  
160° - Best for washers and dishwashers,  
but too hot for use at faucets and  
for hard waters without softener.  
(Thermostatic mixing valve and extra  
piping provides 125° water at faucets  
and 160° water at automatic washer and  
dishwasher. Costs \$15 up for valve  
plus pipe and installation.)
  2. Drain tank and turn off electricity  
if subject to freezing temperatures
  3. Drain 1 or 2 gallons off every month  
or so to remove sediment if any.  
(Shut off lead-in valve - open drain)
-



# ELECTRIC LAUNDRY EQUIPMENT--CONSTRUCTION POINTS, FEATURES AND NEWER DEVELOPMENTS

## ELECTRIC WASHER -- WRINGER TYPE

### Wringer:

- Soft or semi-soft rolls
- One soft, one hard roll
- Safer, streamlined feed boards
- Automatic safety release, or
- Easily operated safety release bars
- Release easy to adjust after using
- Pull-stop (automatically stopped by pull backward on clothes, etc.)
- Pressure control:
  - Automatic (spring type)
  - 1-screw control, centrally located
- Lock stop--4 to 8 places; anywhere
- Rinsing wringer--two wringers with two water sprays and 1 rinsing drum between them
- Wringer elevated by foot pedal, washer top used for workspace

### Cover:

- Hook for hanging it on washer, or
- Hinged to tub
- Rubber mounted

### Tub:

- Square or round: 5-10 lbs. usually
- Size standardization trend--8-9 lbs
- Porcelain enamel most common
- Aluminum, Monel, stainless steel
- Welded
- Single or double wall
- Double tub--two tubs & one wringer
- Insulated from electrical connections

### Agitator:

- Aluminum, plastic
- At bottom of tub; one at top
- Invertible--top or bottom
- Moves around in center; a few makes move off-center (or eccentric)
- Provision for washing small pieces in top of agitator (small bowl)
- 2- or 3-speed control

### Frame:

- Welded, well-braced
- Leg or cabinet type

### Controls and switches:

- Non-automatic: usually
- Semi-automatic:
  - Water connected to rinsing-wringer
  - Timer designed for stopping machine
- Speed control (2- or 3-speed)
- Hand levers or push buttons to start or stop washing action
- Convenient location and height
- Timer
  - Rings bell
  - Automatically stops washer
- See wringer

- Temperature gauge to show heat of water

### Legs and casters:

- Height adjustable
- Larger casters (2"), easily turned
- Rubber casters
- Locking device on one or two legs

### Motor (1/6, 1/4, 1/3 hp.):

- Enclosed or sealed, or
- Open (shaft or belt drive)
- Rubber mounted
- Insulated from framework
- Starting without load--unloader device
- Overload protection

### Drain:

- Pump type
- Gravity drain with hose

### Cord:

- Cord holders on frame or wringer post
- Self winding reel
- Grounding device on a few, usually 3-wire cord with small ground wire projecting near plug

## ELECTRIC WASHER -- SPINNER (CENTRIFUGAL DRYER) TYPE

- Spinner in washing tub or attached tub
- Rinsing cone in one attached spinner
- Spinner cover locks while running

- Basket for water removal has
  - Perforated sides, or
  - Smooth surface--opening around top

## ELECTRIC WASHER - TRAY TYPE

- No tub provided; used in tray or set tubs; one in deep sink

- Agitator washing action
- Wringer water removal

Note: Portable as well as full size wringer and spinner type washers are available. In the above material, only full size washers have been summarized.

## COMBINATION WASHER OR DISHWASHER

Semi-automatic washer or dishwasher  
Cabinet with inter-changeable tubs  
Tub and racks for dishwashing  
Tub, agitator & balancing ring for  
clothes; spinner water removal

Connection to hot and cold water  
Attachments planned:  
Churn  
Potatr peeler  
Freezer

## AUTOMATIC WASHER

Tub:  
Vertical, horizontal or slanting  
In square or round cabinet  
Washing action:  
Agitator  
Standard type  
Pulsating up and down (aluminum  
with 2 circular rubber flanges)  
Cylinder (with or without fins)  
Standard (rotating)  
Bouncing ball with slanting  
metal fins on wall  
Rubber fins on wall  
Control of amount of water used:  
Soapy water held in laundry  
tub and pumped back easily  
Rinse water held in tub below  
Manual setting of amount for load  
Automatic adjustment to load  
Filter screen for cleaning water;  
circulation of water to filter it  
Automatic soap dispenser:  
Measures amount desired  
Furnishes soap for soak or  
wash or both automatically

Controls:  
Time and temperature control  
Single dial  
Two dials  
Water level selector  
Cycle can be interrupted on most  
and a step omitted or added  
Water removal:  
Centrifugal (spinning) common  
Hydraulic pressure  
Balancer to offset unbalanced load  
Automatic stopping of spinning when  
lid is lifted, for safety  
Electric ground:  
Molded into cold water hose wall  
3-wire cord with small separate wire  
near plug end for attachment at  
outlet

FUTURE DEVELOPMENTS:  
Washing by supersonics or high  
frequency sound waves  
Vacuum water removal  
Automatic combination washer-dryer,  
which could wash, soak, rinse,  
spin and dry clothes

## ELECTRIC DRYER

Types:  
Cylinder (tumbling drum)  
Cabinet (hanging racks)  
Wattage:  
1650, or under (115 v.)  
2500 to 5000 (230 v.)  
Controls:  
Automatic control of time  
Automatic control of temperature  
Tumbling basket:  
Porcelain enamel  
Aluminum  
Wire mesh  
Interior light

Sterilizing lamp  
Lint trap:  
Vented to outside  
At waist height, on front  
At base of dryer  
Air filter using water  
Heating unit:  
Encased type (cylinder)  
Embedded in glass wall (cabinet)  
Open coil  
Safety thermostat cut-out  
Fan (operates on 115 v.)  
Moter (operates on 115 v.)

## CONSTRUCTION POINTS, FEATURES, NEWER DEVELOPMENTS

### ELECTRIC IRON

#### Handle:

- Larger, sloping, shaped to hand
- Thumb rest (single or double)
- Open-end type (front or back)
- Shaped to iron comfortably with tip or back of iron at the front
- Change-over R to L-handed handle free

#### Body of iron:

- Tapering sides
- Streamlined, modern, simple design
- Hand protected from heat by:
  - Plastic over metal below handle
  - Air space separating body & handle
  - Insulation inside, above element

#### Weight:

- Standard -  $2\frac{1}{2}$  lbs. up
- Steam - slightly under 4 lbs & up

#### Heat control:

- Thermostat; marked with fabric names, also with degrees F.
- Or heat-limiting device
- On front of handle or under handle
- Arrangement to set control in relation to ironing speed
- Window-thermometer for checking heat

#### Headlight:

- At base of handle - to light ironing

#### Pilot light or signal light:

- Shows when iron reaches temp. set

#### Sole plate:

- Aluminum or aluminum alloy, or Chromium-plated cast iron or steel
- Large area, 21-36" sq. in.
- Narrow point
- Button grooves or slots
- Hinged point or tip
- Beveled edges
- Round rear corners
- Pointed on both ends (side-rest)
- Small upward-swung pointed

section on rear or cord end

- Expansion & contraction of sole plate operates thermostat

#### Protecting board from sole plate:

- Heel rest
- Side rest
- Push-button lift using built-in one-leg stand

Wattage higher (800-1500 w.)

#### Element:

- Wire embedded in insulating material
- Rod-type encased or sealed-in unit
- Unit cast into sole plate
- Metal ribbon on mica sheets
- Coiled wire in porcelain grooves
- Insulated from upper part of iron
- Iron stand (usually non-electrical):
  - Cordless iron has electrical connections in stand (1300 w.)

#### Cord:

- Permanently attached to iron
- Movable--from side to side
  - Called swivel type
  - Safety locked, or free to swivel
- Rubber-covered
- Rubber protective guard at iron
- Wire spring guard at iron
- Attached to stand instead of iron
- Red or gold UL band label

#### Newer developments:

- Glass iron for low-temp. ironing

#### Steam iron:

- Aluminum or stainless steel
- Designed to use dry or with steam
- Thermostat control on most
- Filling cap on body
- Filling cap on handle
- Hinged top raises for refilling
- Tubular element in steam chamber
- Safety valve
- Drip or full-tank heating of water
- Aluminum wool filler in tank

#### Steam adaptor:

- Attaches to front of any iron
- Attaches under sole plate of iron for which made; water tank at back

#### Auxiliary equipment:

- Sit-down ironing board
- Adjustable height and wider boards
- Fire-proof board and coverings
- Cord holder to attach to board
- Iron-hanging stand for wall
- Roller-bearing stand for board

# CONSTRUCTION POINTS, FEATURES AND NEWER DEVELOPMENTS

## ELECTRIC IRONER

### Types:

Rotary (portable, cabinet):

Standard cabinet

Fold-away cabinet, ironer  
stored on end

One make matches washer and  
dryer; deeper than most makes  
Portable, without stand or  
with small stand

Flatplate (cabinet)

### Shoe:

Aluminum; chromium-plated cast iron

Stationary; usually movable

Supported in middle, ends open

Insulation above element

Separate heat control for each end

Hand-ironing or back-and-forth action

Shoe slides lengthwise of roll

Roll oscillates under shoe

Pointed at both ends, or straight

Safety guard on edge

### Element:

1100-1500 w. common; total with  
motor usually 1320-1650 w.

Usually 2 thermostat controls

Pilot light shows ironer is connected

### Roll or buck:

Open at one or both ends

Heavy padding; muslin cover

Metal, rigidly supported

### Location:

Rotary--above or below shoe

Flatplate--below shoe

Flatplate has inclined board

### Moisture jar:

Jar under flatplate board

### Heat control:

Thermostat controlling each end

Marked with fabric names, or

Marked Low, Medium, High

On-and-off switch for heat

### Other controls:

Safety release on shoe, or bar on  
front edge of platform

Hand, knee, or foot stop-start con-  
trol. Adjustable knee control or  
controls

2-3 speed finger-tip control lever

Foot-bar gives several speeds

Roll-stop lever--for pressing,  
drying thick seams, hems

Back-and-forth-action of roll  
(oscillating lever)

On-and-off switch for motor

Safety-switch control box disconnects  
all controls by closing control box

### Cover:

Tips back of shoe and roll

Ends form extension of table top

Swings to right, forming shelves

Cover eliminated on new flatplate

Platform light mounted above roll

Clothes rods

### Platform:

Folding shelves at end, front

One portable type with small roll  
folds up on tube-type stand

Motor (1/30-1/4 hp., usually 1/10-1/6)

### Cord:

Automatic cord rewind

### Legs:

Adjustable height

Casters for easy rolling

# ELECTRIC REFRIGERATOR

## SELECTION, OPERATION, AND CARE POINTS

## NOTES

### REFRIGERATION CYCLE:

Heat in refrigerator passes to cooler evaporator and is absorbed by refrigerant as liquid refrigerant changes to gas. Gas compressed by compressor cools in condenser to liquid, giving off heat to outside air. Liquid refrigerant returns to evaporator, vaporizes. Cycle repeats. Thermostatic control is used to start or stop motor operating compressor, holding temp. set.

### FACTORS IN REFRIGERATED FOOD PRESERVATION:

Condition of food	Relative humidity
Storage temperature	Storage time
Air circulation	Storage techniques

### ADVANTAGES OF ELECTRIC REFRIGERATION:

1. Retards growth of yeast, mold, bacteria
2. Slows action of enzymes
3. Adds variety, attractiveness, palatability
4. Saves homemaker's time and energy
5. Saves money on: left-overs, spoilage, operating cost, excess produce, special sales, quantity buying & cooking, trips
6. May increase income
7. Improves family health

### POSSIBLE REPRODUCTION RATE OF 1 BACTERIUM

No. of Hours	No. of Bacteria
1	4
2	16
3	64
8	65,536
15	1,000,000,000

### RETENTION OF VITAMINS:

	In Refrigerator	At Room Temp.
A	Little loss	Gradual loss
B1	Stable	Stable
B2	No loss by light	Loss from light
C	Little loss	Great loss
D	Stable	Stable

### REFRIGERATE PRODUCE FOR:

#### Home usage:

Short period: hours, day, week  
 Longer time: around 0° F.

#### Market:

Short period: milk, poultry, veg's.  
 Longer time: 32-50°- veg's., fruit  
 Undeveloped freezing possibilities

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#### TYPES OF REFRIGERATORS:

1. Household refrigerator
    - Combination, two-temperature or two-compartment (small storage-freezer & High-humidity section)
    - Standard or conventional
    - 2- or 4-door commercial- or institutional-type
  2. Home freezer (separate zero box; primarily for storage or with freezing compartment separate)
    - Chest or horizontal type
    - Upright or vertical type
  3. Reach-in farm refrigerator with freezer
  4. Walk-in refrigerator with or without freezer
  5. Milk cooler; specialized cabinets for varied uses
  6. Community chillroom for market or home use
  7. Cold storage locker plant
- 

#### ADVANTAGES OF HIGH HUMIDITY:

1. Food can be stored uncovered
2. Vitamin retention is greater
3. Odor transfer is reduced
4. More food can be stored ( $1\frac{1}{2}$ -2X)
5. Lower temp. is maintained

#### Problems

1. Proper control of humidity
  2. Higher initial cost
  3. Higher operation cost
- 

#### SELECTION OF HOUSEHOLD REFRIGERATOR:

Type: Combination or standard; home size or institutional

Size: 6 cu. ft. for two & 1 cu. ft. for each extra two

7 cu. ft. for two & 1 cu. ft. for each extra one

allows fuller use, more saver of time, energy

Storage: Space for frozen foods, meats, cream or milk,

veg's., fruits, eggs, advance food preparation

Adjustable features - convenience vs. cost

Feature and cost comparison: economy, standard, deluxe

Door opening properly for location

---

#### 6 CU. FT. REFRIGERATOR REQUIRES FOR

#### MONTHLY OPERATION APPROXIMATELY:

Ice	700* lbs.
Electricity	30 kwh.
Kerosene	15 gal.
Natural gas	1,000 cu. ft.
Mfg. gas	1,800 cu. ft.

---

#### CABINET:

Dimensions--wide, shallow

Steel--electrically welded, bonderized

Exterior--baked-on synthetic enamel

porcelain enamel

Interior--acid-resisting procelain enamel at least

in bottom; seamless, rounded corners, light

Door--tight-fitting, soft gasket, breaker strips

Hardware--rust-resistant, convenient, sturdy

---

\* Recent Iowa State College study shows 480 lbs.

---

## SHELVES:

### Rust-resistant:

Glass; aluminum    Stainless steel  
Chromium-plated    Tin-dipped steel  
Sturdily constructed  
Closely spaced bars or diamond mesh  
Conveniently spaced in box  
Easily removed and replaced  
Adjustable height--removable sections  
Safety bars & locks if sliding

---

## INSULATION--CONSIDER:

Thickness--minimum, 2"; 3" or 4" best  
Conductivity--low  
Moisture resistant--proofed or encased  
Vibration stability  
Freedom from odor  
Resistant to mold and vermin

---

## MECHANISM--REFRIGERANT:

Refrigerant:    Low and high pressure  
Evaporator:    Flooded or dry  
Motor:    Sealed or open  
Compressor:    Rotary or reciprocating  
Condenser:    Radiator or plate  
Temp. control:    Thermostat or pressure

---

## LOCATION OF REFRIGERATOR:

In preparation center - counter nearby  
In cool place  
Not below 60°-65°F.  
Not too near stove  
Not in sunshine  
Away from heating units  
In dry place  
Air circulation good: 2½" at back  
8-12" above  
Level - door should stay open anywhere

---

## OPERATION OF REFRIGERATOR:

1. Maintain cabinet temperature about 40°F.\*
  2. Use thin containers; cover\*\*
  3. Use clean containers; wipe cans, bottles
  4. Wash and drain veg's., fruits; don't soak
  5. Cool hot foods before storing usually
  6. Assemble things to be put in refrigerator
  7. Place most-used foods near front
  8. Allow space for air circulation\*\*
  9. Wet bottom of tray for fast freezing
  10. Fill trays to ¼" of top
  11. Reset after freezing and defrosting
  12. Take several foods out at once
- 

\* Check with thermometer in morning (or with door closed at least 1 hour before reading); nowhere should temperature be over 50°.

\*\* Not so necessary in high-humidity section of combination household refrigerator.

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### SAVING TIME WITH THE REFRIGERATOR:

Biscuit mixture	Sandwich spreads
Pastry mixture	Sandwiches, lunches
Ref. roll dough	White
Ref. cookie dough	Sauces: Cheese
Cake & other batters	Tomato
Meat loaves, croq.	Dessert
Salads, garnishes	
Advance veg. prep.	Beverage syrups
Grated cheese, rind	Ice cream base
Salad dressings	Quantity cooking:
Potatoes, eggs	Dried fruit Soup
Casserole dishes	Cereals Stew

---

### REFRIGERATION OF FOODS:

<u>Must be</u>	<u>Can be</u>
Dairy products	Cabbage, cucumbers
Fresh meat	Fresh citrus fruit
Frozen foods	Peaches, pineapple
Left-overs, ckd.	Pears, cantaloupe
Open canned goods	Watermelon
" bottled gds.	Bread, cake, pie
Fresh veg's.	Coffee, chocolate
Fresh fruits	Carbonated bev's
	Peanut butter
<u>Must not be</u>	Salad dressing
Bananas	Pickles, olives

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FOODS TO BE STORED -	TEMPERATURE	HUMIDITY
Frozen foods	0-15°	0
Meats, fish, fowl	34-37°	80-90%
Milk, beverages	38-40°	
Butter, staples	40-43°	Moderate
Left-overs, puddings	40-43°	Moderate
Veg's., fruits, eggs	40-45°	85-95%

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### FOOD STORAGE IN CONVENTIONAL REFRIGERATOR:

1. Frozen food: In frozen-food container
2. Meat: Unwrap, cover loosely
3. Milk: In clean, covered container
4. Butter: In butter dish or freezer paper
5. Left-overs: Cover
6. Batters: Cover
7. Eggs: Cover unless used soon
8. Fruits: Berries - unhulled, unwashed, in shallow pan; cover loosely.  
All others washed & covered except short-time storage of plums, pears, citrus fruits.
9. Vegetables: Cover. Leave corn in inner husks; peas, lima beans in pods or shell late as possible & hold in covered jar. Cabbage, cucumber might be left briefly uncovered.

Avoid cutting fruits, veg's., meats in advance

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## HOW TO KEEP MEAT:

### Not to be frozen:

Unwrap; wipe with damp cloth; dry

Place in container

Cover loosely with waxed paper;

Or place in meat keeper

Use fish, ground & variety meats in 24 hours

### To be frozen:

Wrap in waxed paper; separate portions

Place in tray on bottom shelf of freezer

Set control at coldest position

Reset to colder than normal later

Poultry: clean, wash, leave whole

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## FOR GOOD FROZEN DESSERT:

1. Follow good recipe--use cold ingredients

2. Whip thin cream lightly

3. Beat egg whites medium-stiff

4. Freeze rapidly--wet trays on bottom

5. Crush and drain fruits used

6. Chill bowl, beater; beat well

7. Raise temperature after frozen

8. Cover with waxed paper for storage

Ice cream: Stir once during freezing

Ices: Stir twice during freezing

Sherberts: Stir twice during freezing

Mousses: No stirring during freezing

Parfaits: No stirring during freezing

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## FOR SMOOTH DESSERTS:

### Increase air content:

Whipped cream or evaporated milk

Beaten egg whites, gelatin

### Increase viscosity:

Cornstarch    Gelatin    Cookie crumbs

Corn syrup    Egg yolks    Flour

### Increase sugar

$\frac{1}{4}$  c. sugar to 1 c. liquid is enough

### Decrease water (milk and fruit juice)

$\frac{3}{4}$  c. custard to 1 c. cream

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## VARY ICE CREAM BY USING:

Cooked dried fruits    Coffee

Cooked-juice syrup    Chocolate syrup

Fruit sauces, butters    Caramel, butterscotch

Preserves    Toffee candy - rolled

Mashed fresh fruits    Peppermint - rolled

Fresh juice, rind    Peanut brittle - rolled

Brown sugar    Nuts

Maple sugar    Crackers, cookies

Honey, molasses    Coconut

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### CARE OF REFRIGERATOR:

1. Open and close door by handle
2. Store only clean things in refrigerator
3. Wipe up spillage immediately
4. Avoid acid fruits touching enamel
5. Don't use sharp instruments on freezer
6. Defrost when  $\frac{1}{4}$ " thick: clean & dry;  
empty drippage; refill trays; re-set
7. Avoid using harsh abrasives
8. Check gasket, hinges for tightness
9. Touch up scratches (see dealer)
10. Check up regularly & if motors runs a lot
11. Empty, clean, open door for storage  
Open unit - call serviceman in  
Sealed unit - no attention, no oiling
12. Oil open unit according to instructions

---

### CARE OF REFRIGERATOR --- CLEANING

Interior: 1 T soda to 1 qt. warm water  
Remove food, equip. Wash; dry  
Use soapy water on shelves, containers  
Avoid hot water on trays, glass

Gasket: Use warm water, mild soap, clean cloth  
Rinse carefully. Wipe very dry

Exterior: Use warm soapy water; rinse, dry  
Wax 2 or 3 times per year; polish

Condenser: Disconnect refrigerator. Clean  
with whisk broom or vacuum cleaner

---

### COST OF OPERATION DEPENDS ON:

Insulation	Food stored
Location	Quantity
Ventilation	Temperature
Temperature	Wrong containers
Inside	Crowded shelves
In room	Covering food
Ice on unit	No. of ice cubes
Dirty condenser	Desserts frozen
Gasket condition	Unnecessary refrigeration
Size	Opening door

---

### COOLING LOAD:

Opening and closing doors	5%
Cooling foods and liquids	18%
Leakage (insulation joints)	77%

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## CONSTRUCTION POINTS, FEATURES AND NEWER DEVELOPMENTS

### HOUSEHOLD ELECTRIC REFRIGERATOR

#### Types:

- Standard (also convertible ice box, one make designed for change-over)
- Combination (two-temperature or two-compartment; with freezer)

#### Models:

- Upright--economy, standard, deluxe
- Chest or table
- Top-opening chest
- Front opening, with table top

#### Sizes:

- Household--trend toward larger sizes
- Commercial, large-farm, institutional
- All steel cabinet - welded, one piece
- Wider, roomier, shallower
- More storage space,  $1\frac{1}{2}$ -2 cu. ft., for same exterior measurement

#### Exterior finish:

- Synthetic baked-on enamel on steel, bonderized first to prevent rusting
- Porcelain enamel
- Stainless steel

#### Top:

- Flat
- Slightly curved
- Table type--stainless steel top or same finish as rest of cabinet

#### Door:

- Full-length door (refrigerated fruit bin replaces dry-storage)
- Two doors (in some combination & commercial types)
- Door hinged on right or left side
- Many-position control of handle

#### Evaporator in standard type:

- Unit wider, larger
- Conventional unit at side or center
- Shelf type across top
- Drop-down door
- Door held in open position easily
- Removable unrefrigerated shelf
- Refrigerated shelves
- Enclosed sides and back

#### Freezer in combination type:

- Usually  $1-3\frac{1}{2}$  cu. ft.  $0^{\circ}$  space
- Drawers (two,  $3\frac{1}{2}$  cu. ft. total space in lower part of 2-door upright)
- Separate shelf for ice cube trays
- Single dial control, or 2 dials

#### Tray removal - cube removal:

- Lever
- Release instrument

#### Ice cube trays:

- Aluminum, plastic, stainless steel
- Special lacquer finish on aluminum
- Cover for dessert tray
- Covers for trays to facilitate

stacking in combination type

#### Defrost developments (standard type):

- Indicator - red knob on evaporator
- High temperature defrosting
- Automatic defrosting; clock on door
- Automatic return to operation
- Skip-defrost setting provided
- Automatic reset after defrosting
- Defrost jar or tray provided

#### Defrost developments (combination type):

- Less frequent defrosting
- Frost removed by scraping or melting
- High humidity compartment (combination):
- Cooling coils around & behind liner
- Drip jar in compartment, or
- Drippage vented to pan above motor for evaporation

#### Reduced air circulation:

- Glass shelves
- Compartments
- Containers or hydrators

#### Cold control, type & location:

- In single switch with defrost
- Two controls
- Inside or outside of cabinet
- Thermometer provided in some
- Light in refrigerator
- Sterilizing lamp

#### Shelves:

- Farm box with space adaptable for storage of large containers
- Material of shelves
- Porcelain enamel tray under freezer
- Glass
- Rust-proof bars--aluminum, stainless and chromium-plated steel
- Sliding shelves:
- Rail on 3 sides
- Backguards on shelves
- Bumpers and catches on shelves
- Adjustable spacing between shelves
- Removable section in shelf
- Tip-up or fold-back (hinged) features
- Swinging section
- Shelves on inner side of outer door
- Shelves on outer side of inner door

Butter conditioner:

Stores 1 lb. at temperature wished

Meat keeper:

Glass or porcelain enamel dish

Adjustable location

Covered or open type

Wire rack in bottom

Ridged bottom section

Tray type; adjustable tray position

Hydrators:

Drawers--full or half width of liner

Sliding--some with ball bearings

Stacking

Ventilated--a few adjustable vents

Cupboard type with glass doors, glass shelves, deep pan inside

Deeper to accommodate vegetable heads

Suspended utility basket or tray:

Wire basket under shelf

Deep, wide tray under shelf

Bin (usually unrefrigerated):

Tip-bin

Cupboard-type, side-hinged door

Drawer type

Refrigerated tip-out type, near floor behind full-length door

Leveller:

Built-in type for uneven floors

Refrigeration mechanism:

Freon--commonly used refrigerant

Enclosed or sealed mechanism

Oiling decreased or eliminated

Unloader valve (starts without load)

Motor protection--overload cut-out

Noise decreased

Lower operating cost

Longer life, greater efficiency

Single motor; or 2 for some combination types with large freezers

Auxiliary equipment:

Separate automatic defrost control

Carbon filter

Oven-bake dishes, pitchers, etc.

FUTURE DEVELOPMENTS:

Glass refrigerator doors

Opening into kitchen & dining room

Foot pedal for opening door

One-wall kitchen unit, 9-12 cu. ft.

Refrigerated cupboards above

Refrigerated drawers below

Counter-type workspace between

Revolving shelves in round cabinet

Ice water tap

Dishtowel drying rack adjoining

## WHY FREEZE FOODS?

1. Fresh food the year around
  2. New foods and greater variety
  3. Better health and nutrition
  4. Saving time, energy, and food
  5. Easier meal preparation
  6. Always ready for emergencies
- 

## SELECTION OF YOUR FREEZER:

1. Size to fit family needs  
(5 cu. ft. per person - minimum)
  2. Maintain 0° F or lower temperature
  3. Separate freezer compartment desirable
  4. Type of opening - side or top
  5. Accessibility of foods
    - Basket            Shelves            Partitions
    - Trays            Drawers            Wire dividers
  6. Reliability of manufacturer - guarantee
  7. Dealer with facilities for quick repair
  8. Convenience features
    - Alarm                      Temperature indicator
    - Cold control              Method of locking
    - See 5 above              Counterbalanced lid
  9. Costs - initial and operating
- 

## CONSTRUCTION FEATURES:

1. Sealed against moisture vapor from outside
  2. Insulation - not less than 4 inches thick
  3. Motor protected from overloading
  4. Hermetically sealed or open mechanism
  5. Freezer compartment not over 10% of total space
  6. Surfaces and hardware rustproof
  7. Compartment sides - refrigerated and smooth
  8. Drier in refrigerant system
  9. Tension latch; wide or double-sealed gasket
  10. Single lid prevents sweating and frosting
- 

## CHANGES IN FROZEN FOODS ARE CAUSED BY:

1. Bacteria, molds, and yeast
  2. Chemical action of enzymes
  3. Ice formation during freezing
  4. Surface drying or "freezer burn"
  5. Unfavorable storage conditions
  6. Too long a storage period
- 

## RATE OF DRYING WILL BE SLOWER IF:

1. Food is well packaged
  2. Air temperature is uniform, varying only  
one or two degrees above or below 0° F.
  3. Air movement over food is slow
  4. Temperature of coils is as close to  
that of storage space as possible
-

---

#### ESSENTIALS FOR SUCCESSFUL FREEZING:

1. Use suitable varieties and quality foods
  2. Make speed from garden to freezer
  3. Prevent germs from getting on food
  4. Scald all vegetables, then chill
  5. Package properly; seal securely
  6. Freeze at once at 0° F or lower
  7. Store at 0° or lower
- 

#### OPERATION OF FREEZER:

1. Plan ahead; freeze only foods needed
  2. Keep an inventory and chart of location
  3. Use freezer to capacity; budget use
  4. Add food frequently; remove regularly
  5. Freeze foods against wall, 1" between
  6. Put in baskets, mesh bags, or organize space
  7. If power, or freezer fails, don't peek
    - Cover with heavy blankets
    - Put dry ice in each compartment
    - Move food to locker in insulated box
  8. Remove frost, oil, defrost as directed
- 

#### PACKAGING ESSENTIALS:

1. Moisture-vapor-resistant, liquid tight
  2. Grease and water resistant
  3. Space saving in the freezer
  4. Proper size - 1 meal in 1 carton best
  5. Odorless and tasteless
  6. Tough, durable at temperature - 10° to 100° F
  7. Easy to handle, seal, and label
  8. Cheap enough to be practical; reusable
- 

#### PACKAGING MATERIALS:

1. Vapor-resistant cellophane
  2. Latex film
  3. Aluminum foil
  4. Bags of laminated paper
  5. Fiber cups or bags of waxed, treated stock
  6. Glass jars with tops and rubber rings
  7. Tin cans with sealed or friction tops
  8. Film of melted lard
  9. Glaze of ice 1-16" thick
  10. Butcher paper, other untreated paper
  11. Special odorless waxed paper
  12. Stockinette
  13. Labelling aids - special stamps, ink, tags  
or wrapping paper of different color
-

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#### STEPS IN FREEZING VEGETABLES:

1. Select good quality food, not over- or under - ripe
  2. Wash, sort, remove inedible portions
  3. Prepare as for table, uniform pieces
  4. Scald 1 lb. vegetables in 1 gal. water  
For greens, use 1 lb. to 2 gal. water
  5. Steam blanching all right except for greens
  6. Scald or steam with lid on, beginning to  
count time when lid is replaced
  7. Follow recommended time
  8. Chill in iced or cold running water
  9. Drain well, package, seal, freeze immediately
- 

#### COOKING FROZEN VEGETABLES:

1. Cook just enough for 1 meal at a time
  2. Bring 1-4 to 1-2 c salted water to boil
  3. Add frozen vegetables; cover tightly
  4. Heat to boiling rapidly; reduce heat
  5. Time. Use shorter time than if fresh
- 

#### STEPS IN FREEZING FRUITS:

1. Select fruit of good quality, good flavor
  2. Sort for ripeness, bruising, size; wash
  3. Peel (or scald and chill), trim, pit, slice
  4. Treat light-colored fruit for darkening
  5. Prepare sweetening (cold syrup or dry sugar)
  6. Package properly, seal securely, Freeze
- 

#### THAWING FRUITS:

1. Thaw only enough for 1 meal
  2. Leave in sealed container while thawing
  3. Turn package often during thawing
  4. Thaw berries slightly; fruit more  
Fruits are best tasting when just thawed
  5. Never refreeze after thawing
- 

#### FREEZING BEEF, PORK, LAMB:

1. Keep clean, hang, wash, wipe dry
  2. Hang up to chill at 33-39° F.  
Pork and veal 1 to 2 days  
Beef and lamb 5 to 7 days
  3. Cut in pieces, ready to cook
  4. Wrap cuts carefully; exclude air
  5. Spread packages to freeze
  6. Limit storage time  
Sausage, ground meat 1 to 3 mo.  
Fresh pork, fish 3 to 6 mo.  
Lamb and veal 6 to 9 mo.  
Beef, poultry, eggs, dairy 6 to 12 mo.
-

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FREEZING POULTRY, EGGS, FISH:

1. Poultry: slaughter, scald, pick,  
cool, draw, wash; package or glaze
  2. Eggs: break fresh clean eggs  
Whole egg: break yolk, mix, and add  
1 T corn syrup or 1 t salt to 1 c  
Yolk: break and mix to prevent gumminess  
2 T corn syrup or 1 t salt to 1 c  
White: don't mix, add nothing  
(1 T yolk is 1 egg yolk; 1 1-2 T white)
  3. Fish: scald, dress, remove head, wash  
Wrap in moisture-vapor-proof paper, or glaze
-

## ELECTRIC COOKING EQUIPMENT

### SELECTION, OPERATION, AND CARE POINTS

NOTES

#### ELECTRICITY FOR COOKING HEAT:

Wires made of certain metals, in heating units nickel chromium, offer resistance to the passage of electric current which produces heat for cooking.

#### ELECTRIC COOKERY ABC'S:

Accurate	Efficient
Cool	Fast
Clean	Healthful
Convenient	Safe
Dependable	Simple
Economical	Time-saving

#### TYPES OF ELECTRIC COOKING EQUIPMENT:

Small appliances-----	\$ 5 - \$30
Hotplate-----	\$ 5 - \$30
Roasterette or casserole----	\$ 5 - \$10
Roaster-----	\$30 - \$65

#### Range:

Portable-----	\$ 30 - \$100
Space-saving or apartment-	\$115 - \$175
1-oven table top-----	\$120 - \$335
2-oven table top-----	\$275 - \$400
Separate surface units----	\$ 75 - \$150
Separate oven-----	\$125 - \$150

#### IN CHOOSING SMALL APPLIANCES, CONSIDER:

High wattage (around 1000) for speed  
Combination appliances - their uses & cost  
Thermostatic controls. Plain markings  
UL approval on appliance & cord  
Sturdy construction, simple lines  
Chrome-plated or durable finishes  
Reliable manufacturer; good local service

#### USE & CARE OF SMALL APPLIANCES:

1. Study & follow manufacturer's instructions
2. Locate equipment for convenient use
3. Use on 20 amp or appliance circuit
4. Place carefully to avoid dropping
5. Protect cords from: grease dirt, heat  
moisture, kinks, sharp edges, friction
6. Disconnect plug at outlet, then appliance
7. Use mild soap, warm water to wash; rinse, dry.  
Use whitening on stain. Avoid getting units wet.

#### SELECTION POINTS - HOTPLATE:

1. Sturdy construction
2. One unit at least 1000 w
3. Three-speed switch
4. Durable finish (porcelain, chrome)
5. Double unit preferable

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#### OPERATION OF HOTPLATE:

Use on appliance, not lighting circuit  
Start most cooking on High  
Turn to Low or Off when cooking vigorously  
Keep food covered. Time carefully  
Use high-wattage hotplate for canning

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#### CARE OF HOTPLATE (See "Care of Range," p 5):

Open unit: Invert tin pie pan, sprinkled with  
water, over it to clean. Turn to High 10 min.  
Protect from salt, soda, sugar, soap, acid,  
metal, sharp instruments, sharp blows.  
Avoid getting grease or water on cord.

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#### SELECTION OF ROASTER:

Finish: porcelain inside, baked exterior  
Handles: easy to grasp, heat-resistant  
Size: larger size is more practical  
Shape: rectangular shape is preferable  
Insulation: 1 to 2" glass or rock wool  
Thermostat: switch marked with temperatures  
Wattage: 1,000 - 1,320 w, highest better  
Inset pans: ovenware, glass go to table  
Rack: adjustable, sturdy, simple  
Broiler: grid in well better than lid type  
Lid: glass panel; aluminum or chrome-plate  
Cord: rubber covered, UL gold or red band

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#### OPERATION OF ROASTER:

Place on sturdy support at good-working height  
Locate in cooking center, if possible  
Use only on appliance or 20 amp circuit  
Preheat roaster, or grid, for frying  
Preheat for baking, large inset pan in place  
Close adjustable vent during preheating  
Use cold start for oven meals, roasting  
Add 15-30 min. to recipe time for cold start  
 $\frac{1}{4}$  c. water for green veg's.,  $\frac{1}{2}$  c. for starchy  
Place meat for broiling no closer than 2"

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#### SELECTION OF ELECTRIC RANGE:

Common 36" height table-top type matches work  
counters; separate oven fits in at any height  
Sturdy frame - one-piece, braced, welded  
Conveniently located work space, units, controls  
Acid-resisting porcelain enamel top  
Closed tube units; convenient well-labeled switches  
Shelves & drawers--easy moving, lock stopping  
Large well cooker & broiler pan for big family  
Evaluate special features, use vs. cost  
Solve water heating--kitchen heating problems

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#### TYPES OF OVENS & OVEN UNITS:

Ovens: One unit (few made now)

Two unit:

bottom baking heat  
top and bottom heat

Types of units:

open coil  
tubular encased

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#### OVEN SELECTION:

Size: 18-21" deep, 14-18" high, 15-18" wide

Liner: rounded corners, seamless, porc. enamel

Door: tight, counter-balanced, broiler stop,  
hinged at bottom, well-designed latch

Shelves: non-tilt, non-slip rail or wire, lock stopping

Shelf positions: more than 5, or offset shelf (2")

Broiler: under top unit, pref. deep pan

Good insulation; well-located vent

Well-labeled thermostatic control

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#### TYPES OF SURFACE UNITS:

Open coil:

open-labyrinth (few except in well cookers)

covered labyrinth (found in some hotplates)

Closed or encased:

tubular or rod - on nearly all ranges

ring and solid - for replacement units

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#### SWITCH POSITIONS:

High: start steaming, frying, pressure cooking

2nd: continue frying or fry without attention

3rd: cooking without watching, pressure cooking  
melting butter, continue deep-fat frying

4th: continue cooking after steaming

5th: keep food warm, continue cooking

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#### SURFACE COOKING UTENSILS:

Fit unit: Two side handles

2 or 3 qt.--6" unit Heat-resistant handles

4 or 5 qt.--8" unit Recessed knobs on lid

Flat bottom Dull or black bottom

Straight sides Polished sides

Medium weight Steam vent

Tight covers Easily cleaned

Useful in oven too

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#### ECONOMICAL USE OF SURFACE UNITS:

1. Serve one-dish meals often
  2. Use low heat instead of double boiler
  3. Use small units most; have pan fit
  4. Use 1/4-1/2 c. water (or 1/8-1/4" in pan)
  5. Use flat-bottomed, tightly covered pan
  6. Put pan on unit, then set switch
  7. Turn down or off when steaming
  8. Avoid lifting lid and stirring food
- 

#### USES OF WELL COOKER:

1. Cooking less-tender cuts of meats
  2. Complete meals of meat, veg's., dessert
  3. Steaming veg's., puddings, brown bread
  4. Soup, chili, stew
  5. Deep-fat frying
  6. Cooking cereals, dried fruits
  7. Baking potatoes, squash on rack; beans
  8. Making casserole dishes
  9. Reheating rolls or biscuits
  10. Sterilizing jelly glasses, baby bottles
  11. Making large quantity of cocoa, coffee
-

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#### OVEN OPERATION POINTERS:

Select foods using same time & temp. for meals  
Use covers,  $\frac{1}{4}$ - $\frac{1}{2}$  c. water on veg's. & fruits unless baked  
Cook tender meat in shallow, uncovered pan  
Meats & veg's. on bottom; dessert on top shelf  
Allow space between pans and pans & walls  
When using timer, choose foods that can wait  
For baking:

Stagger pans for good heat circulation  
Avoid use of black or enamel pans; change  
time or temp. for faster-cooking glass

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#### ECONOMICAL USE OF OVEN:

1. Use oven to full capacity
  2. Have foods at room temp. generally
  3. Adjust racks before preheating
  4. Preheat only until light goes out
  5. Bake low temp. foods first, then high
  6. Time. Don't overcook. Don't peek
  7. Use stored heat
- 

#### SETTING OVEN THERMOSTAT-SWITCH:

Broiling: Turn to "Broil"  
Preheat: Turn to "Broil" first; then  
set baking temp. immediately  
Timed Bake: Set at temp. required  
Follow directions for timer

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#### USE OF OVEN SWITCH POSITIONS:

Preheat: Rapid heating of oven  
Rare roasts  
Bake-T & B: Most baking  
Oven meals  
Bake-B: Canning\*; large meals  
Quantity baking. See T & B  
Slow broil: Well-done thick steak,  
chicken, chops\*\*, toast  
Speed broil: Rare steaks

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#### PREHEAT OVEN FOR:

Cakes--most types Cookies  
Quick breads Pastry

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#### PREHEATING OVEN UNNECESSARY FOR:

Oven meals Yeast bread  
Cakes--some types Roasting meat

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#### POOR OR UNEVEN BROWNING DUE TO:

1. Oven not level
  2. Black or enamel utensils
  3. Pan too large or warped
  4. Poor placement of pans
  5. Over-crowding oven
  6. Thermostat needing recalibration
  7. Opening door during baking
  8. Poorly fitting door
- 

\*Oven canning is not recommended.

\*\*Broiling uncooked pork (unless frozen 10 to 20 days at 5° F or lower)  
not recommended.

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#### TYPES OF OVEN MEALS:

1. Long-holding type (3-8 hours freed)  
Choose frozen or large cold cuts  
Avoid milk or egg dishes  
Avoid foods that discolor on standing  
Timer must be used for this type, if away
  2. Short-holding type (1-3 hours freed)  
Use any meat suitable for time chosen  
Use perishable foods if wished  
Timer may or may not be used
  3. Interruptable meals  
Usually based on large roast or ham  
Add other foods at start, midway, or end  
Timer not necessary as user is present
- 

#### BROILING POINTERS:

1. Use tender meat. Don't broil pork or veal  
Score fat edges. Choose veg's., fruits  
which cook in same or  $\frac{1}{2}$  time of meat
  2. Brush meat, veg's., fruits with fat  
Sprinkle fruits with sugar
  3. Do not preheat oven or broiling pan
  4. Adjust shelf to hold broiler pan for  

<u>Type of food</u>	<u>Top-of-food to unit</u>
Thin or rare meat	$1\frac{1}{2}$ to 2 inches
Meat, veg's., fruit	2 to 3 inches
Poultry, roast, fish	4 to 5 inches
  5. Set switch &/or thermostat to "Broil"
  6. Leave door ajar; set time reminder
  7. Follow time; turn meat when half done
  8. Do not turn most veg's., fruits, 1" fish
  9. Salt meat, veg's., as dished to serve
- 

#### CLEANING BROILER PAN, RACK:

1. Drain fat and drippings from pan
  2. Wipe pan and rack with dry paper
  3. Scrub pan and rack with brush
  4. Use ammonia on stubborn spots in pan
  5. Use steel wool on broiler rack spots
  6. Do not store broiler pan in oven
- 

#### CARE OF RANGE:

Rotate use of surface units

Avoid twisting wires to surface units

Pull straight out on removable oven units

Avoid overheating

Enamel: protect from spills & acids,  
sudden temp. changes, scratches,  
blows, harsh abrasives, crazing

Cooker: do not heat empty or boil dry  
do not store foods in cooker  
cool well before storing cooker

Oven: open door to dry after using  
avoid heavy weights on door

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CARE OF RANGE - CLEANING:

Remove spillage immediately - paper, dry cloth

Wash when cool - warm soapy water. Rinse, dry

Trim: polish with whiting or silver polish

Units: burn spilled food; remove with soft brush

Wash closed units if necessary

Rims: whiting or 000 steel wool for spots

Reflectors: remove & wash or wipe off as pan

Drip tray: remove & wash or wipe when necessary

Wash utensils like ordinary pans

Cooker: wipe well lining with damp cloth, dry

wipe lid with damp cloth if insulated

Oven unit: char clean; use soft brush, if necessary

Liner: use weak solution ammonia on stubborn stain,

fine abrasive or very fine steel wool

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## ELECTRIC RANGE - CONSTRUCTION POINTS, FEATURES AND NEWER DEVELOPMENTS

### Types available:

- Apartment or space-saving range
  - (some have light, timer, cooker)
- Standard table top (single oven)
- Two-oven table top
- Built-in units and oven
- Fuel-electric combination (wood or coals, coal, oil)
- All-electric oven
- Fuel-electric oven
- Portable (110 v., 2 units, small oven, usually some storage space)
- Institutional (commercial; heavy duty)
- Electronic

### Frame:

- One-piece (welded braces)
- Steel frame with individual, replaceable porcelain panels

### Cooking top (platform or surface):

- In one piece with backsplash
- Acid-resisting porcelain enamel
- Coded for color to simplify matching
- Marbleized top on one combination
- Oven vent in center (see vent)
- Units (usually 3) and well cooker

### Backsplash (on cooking top):

- (Called backplasher, backguard, back panel)

- Slanting or straight
- Curved joining, one-piece with top
- Front servicing ~~pan~~ control panel
- Tilting servicing panel cuts off current

- Time signal and control lamp, outlet or outlets, switches, mirror, recipe holder, condiment set located here

### Switches for surface units:

- Safety switch turns off all units
- Load balancing

### Pushbutton type:

- One control for each speed
- Colors indicate heat intensities
- Across entire length of backsplash

### Conventional rotary, reciprocating:

- On backsplash (in straight row; or in divided or square grouping to show location of units)
- On front side of range frame
- Five or seven heats; numeral or word marking
- Infinite or multi-heat; motor-driven
- Lighted--a color for each speed

### Symbolic marking to show part heated

- Pilot light shows when unit is on
- Free from ridges, dirt catchers

### Surface unit:

- Mostly tube encased
- Some solid or open types optional
- One make has some models with open units
- Flattened or plane surface on tube type
- Slightly raised above platform
- Easy to tilt or raise for cleaning

### Location or arrangement:

- Conventional cluster (R or L)
- Center cluster (work space on ends)
- Divided (work space in middle)
- Row (straight line at rear)
- Staggered
- Triangular

### Outer metal rim clamped ~~on~~ loose in

- Swivel type, turns on edge
- Plug-in type (replacement part)
- Speed-start or supercharger device on unit (thermostatically controlled; supplies extra current for part of a minute; will use 4800 w. on 1200 w. unit)

### Reflector pan (under each surface unit):

- Aluminum, stainless steel or porcelain
- One-piece, more easily removable
- Some permanently mounted
- Larger drain hole in some

### Drip or crumb tray (under unit grouping):

- Time and temperature chart on it
- Some removable without taking out storage drawer

### Made in two parts, overlapping; one-piece

### Cooker unit and control (well cooker):

- Higher wattage (up to 1600 and 2100 w.)

### Lift-to-surface (lift-up) unit:

- Bail to raise unit
- No insulation around well
- More encased units; open coil and ring also used

### Heat in bottom (a few sides also)

- Some insulated; others not
- Automatic turn-down timer switch (up to 30 minutes)

### Over-temperature safety switch (500° F.)

- Automatic timer can be used with well cooker

### Time and temperature control

### Well cooker utensil (on or in cooking top):

- Conventional and pressure types
- Interchangeable conventional and pressure cooker lids

### Well cooker utensil (Cont.):

- 6 or 7 qt. capacity (also 9, 5, and  $2\frac{1}{2}$ )
- Mostly aluminum (some enamel)
- Lid raised above platform, or level
- Glass look-in window in lid
- Glass lid; usually aluminum
- Ledges for trivet positions
- Equipment included in cooker:
  - Inset pans, plain and perforated
  - Double boiler
  - Pudding pan, wire basket, tongs
  - Trivet, baking rack (1- or 2-tier)
- Portable well cooker with thermostat
- Built-in griddle (2000 w.)
- Built-in roaster ( $10\frac{1}{2}$  qt.):
  - Aluminum baking sheet, trivet
  - Aluminum lifting tray
  - 4-piece set of baking glassware
- Range lamp (on backsplash):
  - Fluorescent or incandescent
  - Removable louvered shield
- Indicating lamps (backsplash; elsewhere):
  - Also called signal or pilot lights
  - For oven or ovens; for warmer
  - For surface unit (any or each unit)
  - Colors to indicate intensities of heat
- Time control (on backsplash):
  - Also called automatic timer, timer clock, etc.
  - Single- or two-button control
  - Easier to set
  - Used for oven and outlet, or
  - Some also control cooker or 1 unit
  - Built-in on more expensive models
  - Can be added to most economy models
- Time signal (on backsplash):
  - Called time reminder, interval timer, minute minder)
  - Electrical or mechanical; rings bell
  - Can be bought separately
  - For 1-60 min.; also up to 4 hours
  - One operates outlet up to 60 min.
- Appliance outlet (on backsplash):
  - Two on some--automatic, nonautomatic
- Fuse--above warmer, at back of storage space, in service panel, or back of range
- Condiment set (separate; built-in)
- Oven liner:
  - One-piece stamped liner; or welded
  - Trend toward same size in all models
  - Moisture-tight, rust-proof linings
  - Rounded corners in liner
  - More shelf supports (3 to 17 positions)
  - Vent in surface unit, backsplash, center of platform, oven door or between drip tray and surface units
  - Removable oven-vent grill
  - Removable oven floor, also top reflector

### Oven units:

- Units recessed in liner; lower unit under liner at bottom
- Higher wattage, especially for broiling
- Nearly all two-unit ovens
- One-unit oven with broiler below
- Some encased units; also open coil units
- Lower unit and baffle hinged at rear
- Slow and speed broil; one broiling speed
- Bottom bake, or top and bottom bake
- Removable reflector above top unit
- Removable reflector below bottom unit
- Fan forces air in combination type for oven or kitchen heating
- Heat distributor, shelves and divider:
  - Labelled baffle or heat distributor
  - Oven-divider to make 3-in-1 oven
  - Rust-proof shelves
  - Lock stops on shelves
  - Reversible shelves (offset type)
  - Guard rail (stop bar, nonspill rail)
- Shelf supports (built-in, removable)
- Oven door:
  - Concealed latch with cam action
  - Counter-balanced to stay fixed in any position
  - Broiling stop
- Window in door:
  - Round, double-walled
  - Rectangular or square
  - Manual control for oven light
  - More insulation in door
  - Tight-fitting door; steel or iron hinges, plated
  - Bottom-hinged
  - Bar type handles--some wide as door
- Oven unit and/or thermostat control:
  - Single dial oven control (thermostat and switch together) preheat by:
    - Turning switch to broil then to temperature wanted, or
    - Push-button with automatic return to baking when temp. is reached
  - Separate thermostat and unit controls:
    - 5-7 position conventional switch
    - Push-button switches--colored lights
  - Thermostat control for temp. only
- Oven light:
  - Set flush in side wall
  - Set flush in back wall (recessed light)
  - Automatically on when door opens
  - Turn on to see through glass window
  - Indicating or signal lamp, glows if oven is on - signal for preheating
- Insulation:
  - Much glass wool or glass fiber used, also mineral or rock wool
  - Wrap around blanket, double at top; also bats
  - $1\frac{3}{8}$ " in door;  $1\frac{1}{2}$ - $2\frac{1}{2}$ " in walls
  - 2 to 3" on top

Broiler pan and racks or grid:

Distance from unit adjustable  
through shelf position and  
reversible broiler rack or  
shelf

Deeper broilers, wider bars in racks  
Bottom of pan shaped to fit large  
surface unit

Adjustable rack for use as V-rack

Cast aluminum grid; enamel or wires

One-piece aluminum broiler rack with  
center hole or slot

Storage space provided outside of oven

Warmer or warming compartment:

Indicating lamp

Switch located with other switches,  
or sometimes in range, above drawer

Some are thermostatically controlled.

Plate warmer rack for some makes

Storage compartments:

Drawer most common

Roller-bearing glides on drawer

Front of drawer heightened to give  
formal balance with oven door

Cupboard type with side-hinged door

Narrow cupboards flanking center oven

Shelves (full and half); permanent  
or movable in cupboard type

Door rack for lids, utensils, cutlery

Some wider ones on cheaper models:

Drawer type--full width of range

Tip-out bin (1 door with 2 bins)

Full-width door, hinged at bottom

Built-in kitchen heater or cooler:

Controlled by automatic timer which  
also controls outlet simultaneously

May go in storage drawer space

Adjustable floor levellers.

Toe space of enamel or aluminum in base

Range cord or pigtail:

3-wire cable, molded-on plug

Attached; free with range

Separate and at extra cost

Auxiliary equipment:

Surface utensils; griddle; roasting pan

Time signal lamp (mechanical or  
electrical)

Time control or clock

Lift-up well cooker; pressure cooker

FUTURE DEVELOPMENTS: Built-in round  
ranges and revolving shelves. Glass  
ovens. Ceramic stove in any color.  
Electronic cookery--manufacturer  
prophesies \$200-\$300 model in 1950's  
for home use; this type of equipment  
is now rented to hotels. Colored  
porcelain enamel finish.

# INFORMATION FROM "MANUFACTURERS' SPECIFICATIONS OF ELECTRIC HOUSEHOLD RANGES"

COST \$119-139.95-144-149-154-159-164-169-179-184-189-194-199-204-209  
 NO. OF MODELS 1 2 1 1 4 3 1 3 6 2 4 2 5 1 3

COST \$214-219-229-234-239-249-254-259-269-274-279-284-289-295-299-304  
 NO. OF MODELS 3 2 2 2 4 2 4 3 5 1 4 1 1 1 2 1

COST \$319-324-329-334-339-354-359-369-374-379-384-395-399  
 NO. OF MODELS 2 1 5 1 2 1 2 4 1 1 1 1 4

RANGE WIDTH 18 $\frac{1}{2}$ -19-19 $\frac{1}{2}$ -20-21-21 $\frac{1}{2}$ -22-24-24 $\frac{1}{2}$ -26-30-36-37-38-38 $\frac{1}{2}$ -39-40-40 $\frac{1}{2}$   
 NO. OF MODELS 1 1 2 6 4 1 1 1 1 1 1 5 4 11 3 19 51 3

RANGE WIDTH 41-44 $\frac{1}{4}$ -46 (wood or coal electric combinations from 36-46")  
 NO. OF MODELS 3 2 1 - " " " " " "

COOKER WATTAGE 750-790-800-1000-1200-1250-1300-1600-2100  
 NO. OF MODELS 1 3 6 4 7 5 2 2 2

OVEN HEIGHT 9-10-10 $\frac{1}{2}$ -11-11 $\frac{1}{2}$  (Preceding are second oven in two-oven range)  
 NO. OF MODELS 2 2 2 2 1

OVEN HEIGHT 12-13-13 $\frac{1}{2}$ -14-15-15 $\frac{1}{2}$ -16-16 $\frac{1}{2}$ -17-18  
 NO. OF MODELS 2 2 2 4 18 9 41 5 25 4

OVEN WIDTH 15-16-16 $\frac{1}{2}$ -17-18-19  
 NO. OF MODELS 1 77 5 20 3 1 (coal-electric)

OVEN DEPTH 18-19-19 $\frac{1}{2}$ -20-21-24  
 NO. OF MODELS 3 35 29 54 1 1 (coal-electric)

OVEN WATTAGE: Preheating - 4000 to 7600 w; bake - 1800 to 4000 w bottom unit  
 with none above or 200 to 800 w above; broil 2000 to 4200 w.

## SOURCES OF PRINTED INFORMATION ON ELECTRICAL EQUIPMENT

### Federal Government and State Agencies:

#### State College

Agricultural and Home Economics Extension Service.  
Experiment Station.

College departments occasionally having some releases: Home Economics,  
Agricultural Engineering and Engineering.

Federal Security Agency, Washington 25, D. C.

\*U. S. Office of Education.

#### Tennessee Valley Authority

\*Agricultural Engineering Development Division, Commerce Department, TVA,  
Knoxville, Tennessee.

Training Staff, Personnel Department, TVA, Knoxville, Tennessee.

Bibliography of Apprenticeship Instructional Materials.

Electrical Development Division, TVA, Chattanooga, Tennessee  
Educational materials.

Superintendent of Documents, U. S. Government Printing Office, Washington 25,  
D. C. Ask for Price Lists on Foods and Cooking, U. S. Office of Education,  
Radio Publications, Standards of Weight and Measure, Farm Management, Health.

U. S. Department of Agriculture, Washington 25, D. C.

\*Office of Information.

\*Bureau of Human Nutrition and Home Economics.

\*Rural Electrification Administration.

### Professional and/or Technical Organizations:

\*American Home Economics Association, 700 Victor Building, Washington, D. C.

\*American Standards Association, 70 East 45th Street, New York 17, New York.

\*American Society of Refrigerating Engineers, 40 West 40th Street,  
New York 18, New York.

\*Illuminating Engineering Society, 51 Madison Avenue, New York 10, New York.

International Association of Electrical Inspectors, 612 North Michigan  
Avenue, Chicago 11, Illinois. Publishes consumer safety bulletin for  
purchase.

\*National Education Association, 1201 Sixteenth Street, N. W., Washington 6,  
D. C. "Teaching About Light and Sight," 30¢; "Safety Thru Elementary  
Science," 50¢.

National Safety Council, 20 North Wacker Drive, Chicago, Illinois.

Underwriters Laboratories, Inc., 207 East Ohio Street, Chicago 11, Illinois.  
Bulletins on testing for safety. List of inspected equipment - Free.

\*Printed list of materials available.

Commercial Groups:

Manufacturers of electrical household equipment are listed in the "Classified Directory of Appliance and Radio Manufacturers," published by "Electrical Merchandising," 330 West 42nd Street, New York 18, New York. 50¢.

Manufacturers of electrically operated farm productive equipment are listed in a directory available from Rural Electric Information Exchange, Farm Journal, 420 Lexington Avenue, New York 17, New York. Also publishes other releases.

American Washer and Ironer Manufacturers' Association, 141 Jackson Boulevard, Chicago, Illinois. Furnishes instruction books for manufacturers' imprinting and use. Promotional materials.

\*Better Light Better Sight Bureau, 420 Lexington Avenue, New York 17, New York.

\*Certified Lamp Makers, 2116 Keith Building, Cleveland 15, Ohio.

\*National Adequate Wiring Bureau, 155 East 44th Street, New York 17, New York.

National Association of Domestic and Farm Pumping Equipment Manufacturers, 39 South La Salle Street, Chicago 3, Illinois. Publishes water supply manual, \$1.50. Also promotional materials.

National Electrical Manufacturers Association, 155 East 44th Street, New York 17, New York.

Farm and Home Freezer Section.

Electric Range Section.

Electric Water Heater Section.

\*Standards Publications Section.

Radio Manufacturers Association, 1317 F Street, N. W., Washington 4, D. C.

Vacuum Cleaners Manufacturers' Association, 1070 East 152nd Street, Cleveland 10, Ohio.

Independent Organizations:

\*Household Finance Corporation, 919 North Michigan Avenue, Chicago 11, Illinois.

\*Small Homes Council, Mumford House, University of Illinois, Urbana, Illinois.

Other Sources:

Magazines - Trade, professional, agricultural, home economics, science and women's magazines and the regular publications of technical societies, manufacturers and commodity analyses organizations.

Books - Numerous books on different phases of farm, home and community electrification are available. Secure bibliography from REA.

\*Printed list of materials available.